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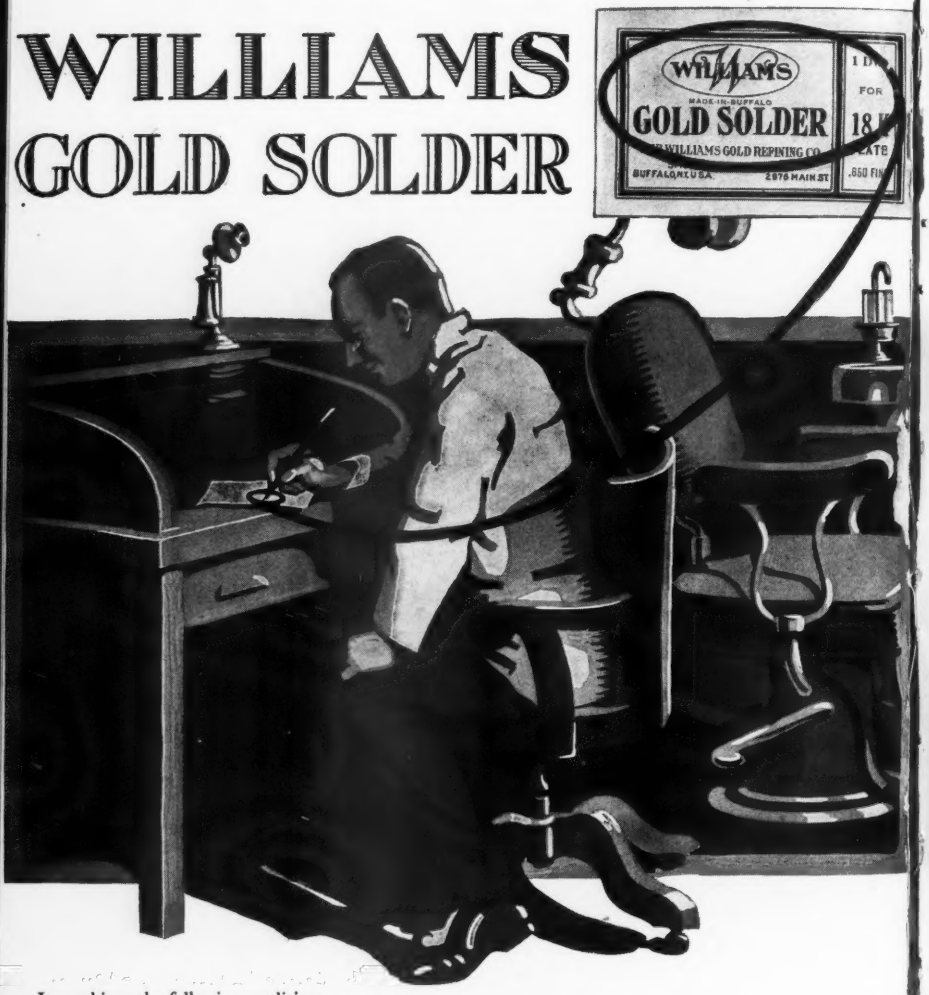

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THE
DENTAL DIGEST

Vol. XXV APRIL, 1919 No. 4

ORTHODONTIA OF DECIDUOUS TEETH*

By E. A. Bogue, M.D., New York, N. Y.

I am honored by being allowed to talk on orthodontia to gentlemen who practise orthopedia, and have given me permission to be as colloquial as I please.

As the subject was to be orthodontia of *deciduous* teeth, the question at once arises as to why deciduous teeth should need orthodontia.

During many years I enjoyed the acquaintance of artists in Paris, both sculptors and painters, and have many times heard from them that the middle of the upper arch of teeth was never to be found immediately over the middle of the arch of the lower teeth. My own observation confirmed this statement, but I never knew why this *was* so until I learned it through the reports of the various boards of health around the country. Since then I have had the pleasure of placing a good many upper centres directly over the lower central space.

The New York Board of Health, through Dr. John J. Gronin, announced that an examination of 104,000 school children showed about 71 per cent. of them to be defective in nose, eyes, ears, teeth, throat or thorax.

The Detroit Board of Health, Dr. Hartz, made the percentage about 70. The Cleveland Hygienic Committee, Dr. Ebersole, made that percentage 95 or 96. The Forsyth Institute of Boston during the first year of experience with orthodontic cases, made that percentage 96, and that at once would bring the question—What is normality?

In order to answer that question we must first find what normality in the adult is, and I will show you presently the best and most perfect case in my own museum of sixteen or eighteen hundred cases, and you will see that the teeth of that person close together in such way that the incisor or cutting teeth in front shut like scissors; the twenty grinding teeth shut in such manner that their various cusps interdigitate with the sulci of the opposing row of teeth, so that the lateral motion of the jaw gives the greatest amount of surface with which to triturate the food, and

*Read before the Orthopedic Section of the Academy of Medicine of New York.

the more deeply we study this occlusion of the upper and lower teeth with each other the more thoroughly we are convinced that variation from a true arch, with its distal ends slightly separated, can never differ much from this mechanical perfection for trituration without affecting deleteriously functions of the nose, the various antra, the eustachian tubes, the hearing apparatus and the organs of speech.

We find a distinct relationship between the sizes of deciduous teeth and the permanent teeth which are to follow, and that the permanent teeth, the first of which make their appearance at about six years of age, are uniformly within the arches of these deciduous teeth, the crowns of the bicuspids being embraced by the roots of the deciduous molars. We now see that if the deciduous arches are not almost as large as the arches of the permanent teeth one of two things must occur; either that there must be a deposit of bony matter between the temporary teeth, thus spreading and enlarging the arches of the little child to the size of the adult arches, or else that the larger permanent teeth, which come through practically in the same places occupied by the small temporary teeth, will come through crowded, for with 96 per cent. or even 70 per cent. of the deciduous dental arches smaller than the normal adult arches there is not room for the permanent teeth to come through regularly. I am saying this presuming upon your knowledge that the *crowns* of the permanent teeth are just as large at four or five years of age as they ever will be, although they are hidden from view.

The experiences of the past few years have demonstrated to my entire satisfaction that unless the arches of deciduous teeth after they are fully erupted are more than 28 mms. broad between the last upper molars that bony matter will *not* be deposited between these deciduous teeth, and consequently the arches will *not* grow any larger; hence some outside influences must be brought to bear or we shall have such results as deafness, mouth breathing, inability to enunciate correctly and liability to contract any of the so-called children's diseases.

Let me tell of some clinical experiences, which gradually led up to the present method of practice.

In 1895 a child of $4\frac{1}{2}$ years of age came under my care, whose deciduous teeth were so markedly irregular that I made models of them. Not knowing at that date what to do for so young a child, I waited five years to see if Nature would not correct the irregularity. I finally made up my mind that the permanent teeth were erupting more and more irregularly. The arches did not grow larger, and at last, in April 1900, I put a regulating appliance on the deciduous teeth, and by means of it drew both deciduous and permanent teeth into position. I did the same thing for her brother, and gained a good degree of regularity. A description of

these cases was printed in the *Journal of the American Medical Association*, August 9, 1902, as "Observations on some recent cases of Orthodontia." The conclusion of that paper was that these operations would be almost or quite painless, that they may be accomplished with great rapidity if necessary, and with such certainty that absence, through unexpected sickness or protracted journeyings, need not interrupt the orderly progress of the work, provided sufficient notice be given to the operator; that this work may be accomplished with no perceptible detriment to the teeth, and that the regulating fixtures themselves may be retained as retainers weeks or months after they have finished their corrective work.

As the permanent teeth follow very nearly the lines of the deciduous teeth, whether these latter be regular or irregular, and the size of the arches of the ten front teeth of the permanent set will almost exactly correspond to the arches of the deciduous teeth, which preceded them, it becomes important to see to it that the deciduous teeth either spread apart of themselves or are spread during the first six years of life while the greatest and most rapid growth is taking place, so that the permanent teeth shall have room to come through regularly and without crowding. The first permanent or principal molar, also known as the six year molar, appears about this time.

Another reason why orthodontia of the deciduous teeth should be practised in civilized communities was brought very forcibly to my attention at the Hygienic Exposition in Dresden a few years ago, when I found that the average weight of the brain of the child at birth is 371 grammes, at six years of age its average weight being 1,360 grammes, and at nineteen years of age 1,400—a gain of 989 grammes in the first six years, only 40 grammes in the last twelve.

This bit of scientific knowledge should be placed alongside of an experiment made by Dr. Lawrence Baker of Boston, who ground off the teeth on one side of the mouth of several young rabbits, and kept them ground off until they reached adult life, when the whole litter was killed and their skulls examined, with the result that the left side of those skulls which had been deprived on the right of their masticating function were larger than the mutilated sides; the capacity of the brain box was greater and the general well-being of the animal was more marked upon the side where function had been properly performed than upon the mutilated side.

This series of experiments found confirmation a short time afterwards in a series of experiments made in the University of Berlin by Landsberger on some puppies, from a number of which he took the germs of the teeth on one side of the mouth so as to effectually inhibit the performance

of function on that side, and the same results as were found by Dr. Baker in Boston occurred with him. The mutilated side where function was not performed, was smaller when compared with the uninjured animals. It is, of course, impossible to prove that greater brain capacity would be any better in any individual case, but we may infer considerable along these lines.

I shall hope to show you a few slides of the work of my friend, Dr. Price of Cleveland, who has spread the arches of a feeble-minded boy of fifteen, relieving apparently the pressure upon the covering of the pituitory, with results that you will see for yourselves, and in regard to which much still remains to be learned.

Some years ago the Smithsonian Institution at Washington had only three or four aboriginal baby skulls. It now has six hundred or more. The last time I was in Washington Prof. Hrdlicka was kind enough to place eighty of the most perfect ones on a table together where I could measure them. Seventy-nine of those skulls correspond very nearly to what we consider normality. One only was narrow like our civilized children.

I shall also take occasion to show you a few cases, where from three to six years have passed between the first and last models, where no mechanical apparatus has been employed to enlarge the arches. You will at once see that if these arches did not grow in three or six years, even to 1/100 of an inch, the probabilities are that they will not grow in several more years, and in proof of that I expect to show you a model of a lady—mother of four children—the width of whose arch does not exceed 28 mms.; at the same time I shall show you the photograph of models of two of her children—one $3\frac{1}{2}$ years old, the measurement of whose upper arch already at that age exceeds that of her mother by several millimeters, while her brother, who was less than 28 mms. broad two years ago, has been mechanically spread, with results that I will take great pleasure in showing you.

I shall add also that a little apparatus devised in England that we call a respirator has been used for him as well as the spreader, and I think has had much to do with the closure of his lips, and consequently the improvement of his physiognomy.

I have emphasized the fact that unless the upper deciduous dental arch in the second molar region exceeds 28 mms. in breadth the prognosis is not good for a normal development, either of the dental arches or the palate, or the nasal passages, and in these cases of saddle-shaped arches we are almost certain to find curvature of the spine, diminution of the thoracic cavity, and limited heart action, which means, of course, inhibition of growth.

I have been asked if the size of the teeth do not make any difference as to the width of the arch in different individuals, and how I can fix 28 mms. as the minimum breadth of an arch that may possibly develop. My reply is, No, the size of the teeth would not make a difference in the figures given as the minimum width of any arch that may possibly develop later into normality. The normal arch of temporary teeth is somewhere from 32 to 35 mms. in breadth. The difference between normality at 35 mms. and a possible normality at 28 mms. consists mostly in the bony tissue between the teeth. This bony tissue has been and is being deposited all around in that neighborhood. This includes the bones of the face, which involve the antra; the bones of the nose, which involve the nasal passages, and the bones of the skull, which include the brain box. The growth of all these is more or less dependent upon the exercise of the muscles which are inserted into the mandible and upper maxillary and the temporal region. The exercising of these muscles is in turn dependent upon the general physical condition of the child. If the vigor of childhood is not sufficient to cause union of enamel plates, let no one imagine that anything else than a mechanical completion by man of Nature's work is going to save those teeth from ultimate destruction through decay, and the earlier that unfinished job of Nature is completed the better for the patient.

It may be discovered that some of the glandular extracts may be administered to advantage very early in life when those adverse conditions become known through the position of the teeth and the indisposition of the child to exert himself, when he quickly gets tired with his play, or walks with a slouching gait; but I have found the mechanical apparatus so useful in correcting these conditions that it has been a pleasure to bring it to your attention.

Dr. Bogue then exhibited a number of lantern slides and models some of which are shown in the accompanying illustrations).

1 2 3

ILLUSTRATIONS 1, 2, 3, 4, 5

Adult skull showing irregular teeth on left side, but unusually regular ones on the right.

Regularity involves the position of the molars; the anterior cusp of lower molar on the right is forward of the upper, and all the teeth are so arranged on that side that the trituration of food by the lateral movement of the mandible is well performed.

The lower teeth as a rule develop and push through the gum previous to the upper teeth.

In this case the two right lower incisors did *not* develop into a perfect arch.

By following the suture of the upper maxillary, it is seen that the nasal septum is deflected.

The left orbit is smaller than the right, the left zygoma is smaller than the right, the articulation of the lower molar teeth on the left is one cusp posterior instead of being anterior to the upper molars.

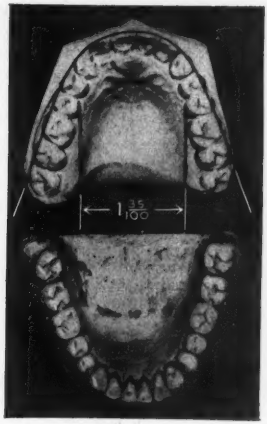
This disarranges the entire articulation on that side of the mouth.

The foramen magnum is smaller on the left than on the right; the left upper cuspid distinctly laps the adjoining lateral and bicuspid.

This shows the whole left side of the skull to be smaller than the right and less perfect in all visible characteristics, and these defects are always manifest in the face of the individual.

4 5

These various irregularities can, if taken early enough, be painlessly corrected, and the skull permitted to grow to its normal size and uniformity with the teeth in regular positions and the nasal passages ample; and this means regularity of all parts of the face, and also means the beauty as well as health and vigor of normality.

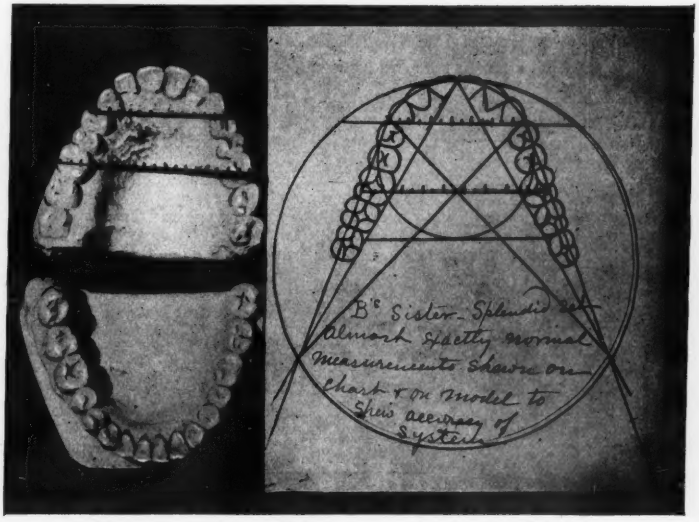


6

ILLUSTRATIONS 6, 7

Model of nearly perfect and regular teeth, lady about thirty years of age.

The dental arches correspond to the measurements given by Bonwill and Hawley many years ago, so that the wire arch made on the mathematical lines of the measurements of these teeth, lies on the buccal cusps of the upper grinding teeth and along the cutting edges of the incisors.



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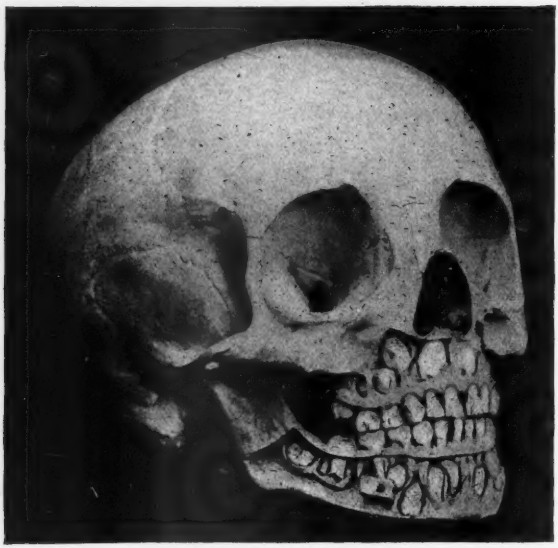
This lady was never a mouth breather, was in good health, teeth showed no evidence of decay and both sides of the mouth articulate so perfectly that the trituration of food takes place everywhere between the teeth with ease and precision.

Among my 1,600 models there are only two or three that in perfection approximate this.

The width of this arch is 33 millimeters at the bicuspid region.

These characteristics indicate a continuance of good health from birth until the eruption of the permanent teeth and a stature rather below than above medium height.



8

ILLUSTRATION 8

Skull of a child about 6½ years of age. First permanent molars beginning to come through the gums but are not yet as long as the deciduous teeth. There is posterior malocclusion on left side.

Crowns of the permanent bicuspids fully formed and lying between the roots of the deciduous molars.

The upper deciduous molars have three roots which embrace the bicuspid crowns.

It is easy to see that if these deciduous teeth are in an arch that is too narrow, and that can be broadened by moving the deciduous teeth, these three roots will carry the permanent bicuspid crowns with them to whatever spot they are moved.

If the spot to which they should be moved can be pre-determined, and the movement made *before these roots shall have absorbed* and *passed away*, the bicuspid crowns will be transported to the right spot and the permanent roots will be in the positions which they ought to occupy for life; they will not need retainers.

If, however, one waits until the child is seven or eight years old, or more, before moving these deciduous teeth to their right places, the roots will have been absorbed, the deciduous arches will be enlarged, but the permanent bicuspid crowns, which occupy the most vital point in the scheme for correction, will not be moved as they should be.

The bicuspid teeth will then have to be moved by themselves, and the enlargement of the nasal passage will be proportionately deferred and made more difficult to accomplish, if it can be done at all.

The permanent incisor crowns are as large at six years of age as they ever will be, yet in their development they lie behind and within the circle of the roots of the deciduous teeth.

ILLUSTRATION 9—(Reed C.)

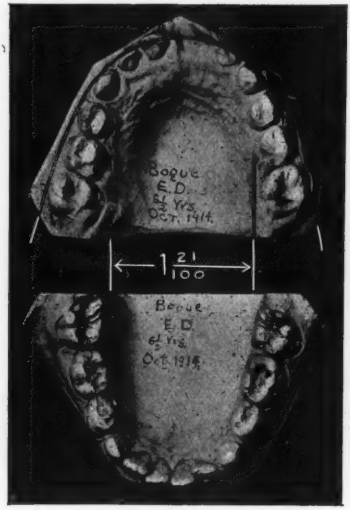
In all *strictly normal* cases (and these are few) the small deciduous front teeth stand apart from each other and so form an arch large enough to permit the permanent incisor crowns to take the place of the deciduous crowns as they fall out, and still have room to stand regularly in their arches.

If, therefore, from four to six years of age we find narrow arches of deciduous teeth, we can be certain that without mechanical intervention nothing short of a miracle will accomplish the eruption of the permanent teeth into regular positions; and the earlier we spread the deciduous arches to their normal size, the more likely we shall be to broaden the nasal passages

9

and facilitate nasal breathing, a closed mouth, and a regular and normal eruption of the permanent teeth.

Regular permanent teeth mean a great addition to both the beauty and health of their possessor.



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11

ILLUSTRATIONS 10, 11, 12—(Edward D.)

Another instance where I got an impression, in October, 1914, of a child six and a half years old, was supplemented by a photograph of the same child at two and a half years old. The front teeth stand apart markedly.

Since this paper was written I have taken another impression, and here show models of the same mouth at ten years and four months.

These models show an admirably arranged set of permanent teeth standing slightly apart, and save for the pits of the sulci, showing no tendency to decay.

12

The width of the mouth has not changed between October 25, 1914, and February 15, 1919.

Yet the deciduous teeth have all fallen out and been replaced by the permanent set.

Finding four cavities in each of this boy's first permanent molars, I told the mother that these teeth were all formed at the same time when the child was about two and a half to three years of age, and that the boy must have been ill about that time.

She said he *was* very ill at that time, injured his arm in a fall from his tricycle, was taken to the hospital, where they used bi-chloride of mercury by mistake and poisoned him.

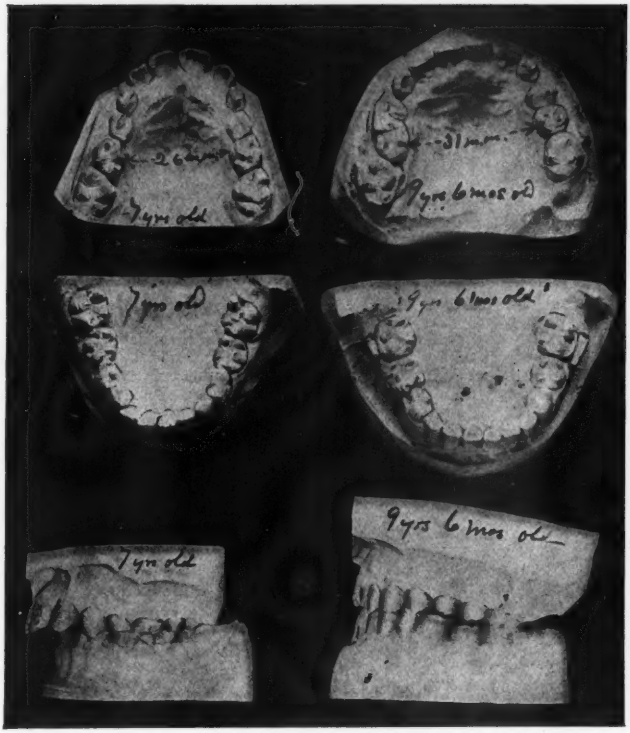
13

ILLUSTRATIONS 13, 14, 15—(G. A. L.)

Boy seven years old, son of a distinguished surgeon, who had these photographs taken for me.

The upper dental arch of deciduous teeth was 26 millimeters broad in the region of the second deciduous molars.

At eight and a half years, the dental arch had been spread to 31 millimeters broad, with one bicuspid on the left, and one temporary molar still remaining on the right.



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It has been necessary in this case to spread the bicuspids laterally, as the roots of the deciduous teeth were too much absorbed at that age to move the crowns of the permanent teeth where they were wanted.

The apparatus has been at work as spreader and retainer for two years.

Another six months of retention, with possibly some rotation of bicuspids, will be required.

A portrait taken a few months ago is presented as showing conditions at that stage.

15

16

ILLUSTRATIONS 16, 17, 18—(John B. W.)

Portrait of a boy five years old, mouth breather. Models of same child, five years old, whose upper arch was 28 millimeters broad at the second deciduous molar region.

In ten months he was spread to 35 millimeters between the same two teeth; the entire arch was slightly enlarged, which caused a certain amount of spreading between the forward teeth,

17

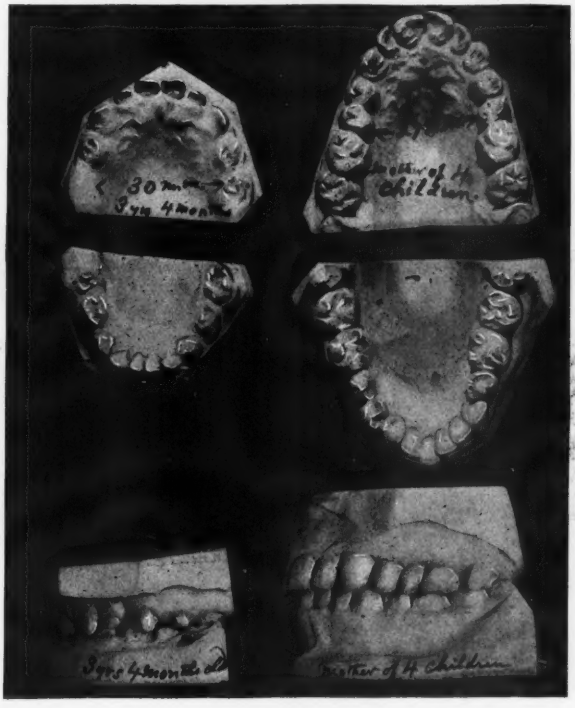
which I estimated would be enough to allow of regular eruption of the permanent teeth when they push through the gum.

After a few months the mother sent me his photograph as seen herewith (No. 18).

The boy was taken away for change of climate; upon his return, I found that adenoids had recurred, bringing with them mouth breathing.

The child was at once sent to his family physician, who promptly had the adenoids removed and began other treatment which he found imperative.

18



19 and 20

ILLUSTRATION 19—(Margaret W.)

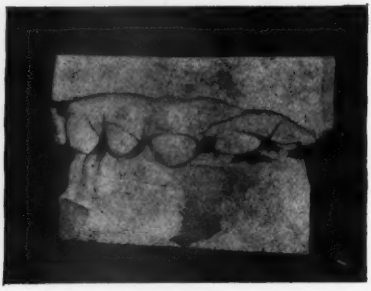
This shows the little daughter, Margaret, three years and four months old, whose upper dental arch at that age was 30 millimeters broad at the second temporary molar region, in contrast to the mother, whose upper arch is only 27 millimeters broad.

This child has never been a mouth breather, is healthy, muscular and active beyond adequate expression.

ILLUSTRATION 20

A model of the mother of this boy. Her upper dental arch is only 27 millimeters broad at the second bicuspid region.

This case shows a lack of growth in breadth from three or four years of age to now, so that further cases are not needed to prove the statement that unless a certain width exists at three or four years of age lateral growth without help need not be expected.



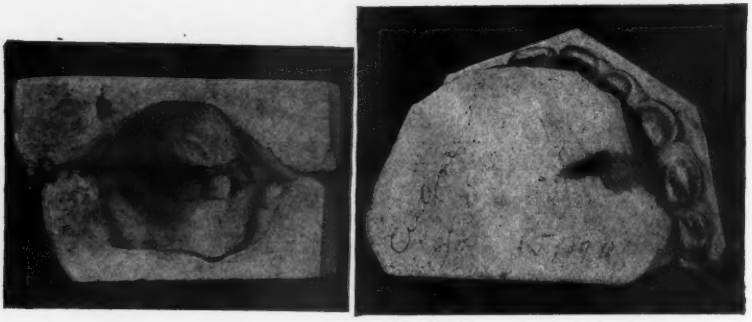
21

ILLUSTRATIONS 21, 22—(Eugene W.)

Another child of the same family. Models made in June, 1917, of this little boy two years and three months old.

At the second temporary molar region, the width of his upper arch was the same as his mother's.

In January, 1919, the child's teeth have pushed through the gum, and the upper molars on the left side strike the buccal surfaces of the lower molars instead of striking on the occlusal surfaces where mastication should be performed.

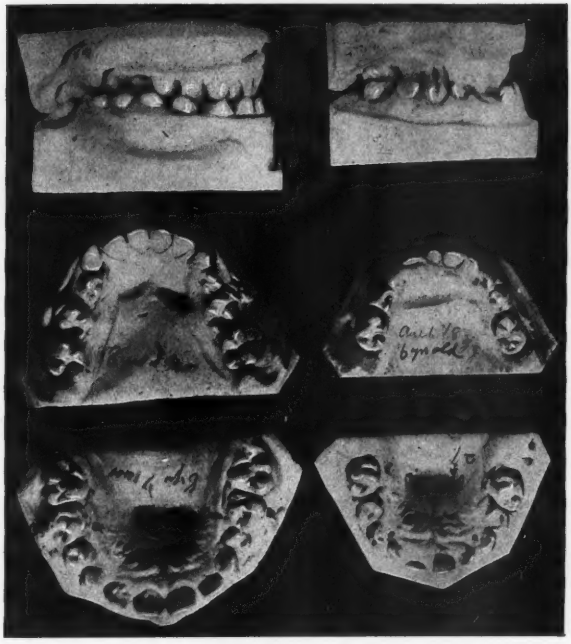


22A 22B

The consequence of this malocclusion was that the upper molars were driven outward toward the cheek, making the upper arch at that point 30 millimeters broad while the lower ones were driven inward toward the tongue, making a one-sided condition of the mouth, and pointing to a mal-position of the permanent molars when they shall make their appearance between two and three years hence.

If this condition is at once rectified, the prognosis is favorable for a correct development of the masticating teeth.

The members of one family may show a good deal of variation in arch size and arch form.



23 and 24

ILLUSTRATIONS 23, 24—(Henry B. K.)

These two models represent a little boy six years and four months old whose upper arch was 27 millimeters in width.

He had had abscesses in his ears in the spring of 1914, and again in the spring of 1916, ear drums being pierced both times.

Very considerable deafness had supervened and continued up to the time we began our work.

I put on a spreading appliance the last of May, 1916. In six months we had spread the arches so that the upper arch measured 35 millimeters between the second temporary molars.

By this time the pressure on the eustachian tubes had been so much relieved, that deafness was no longer apparent and the boy heard the ticking of a watch five feet away equally well with both ears.

This improvement in hearing has continued until this writing, Nov. 1918.

On Nov. 9, 1916, I gave him a respirator to be used at night.

This respirator is made of hard rubber and lies between the lips and teeth, over teeth and gums. It prevented breathing through the mouth, as the nasal passages were then ample and have remained so ever since, so that he is no longer a mouth breather.

He has good occlusion of all his grinding teeth, the incisors close correctly, the centres of upper and lower arches are opposite each other and every indication presages regularity for the future.

This means good mastication, clear speech and distinct enunciation.

His health is good, his mouth is generally closed both day and night, and the same width has been retained for more than a year by leaving the appliances in place attached as they are to the deciduous teeth.

By commencing the spreading process as early as five years of age, it is not necessary to attach spreading apparatus to any of the permanent teeth, and danger of decay from that source is wholly eliminated; besides, children that are carefully taught to keep their teeth clean at all times, acquire habits of cleanliness that remain through life and dental troubles are far less frequent.

I have never carried through a case of regulation of the deciduous teeth that was followed by decay of the permanent teeth, caused by regulating appliances.

25

ILLUSTRATIONS 25, 26, 27, 28, 29—(Mary P.)

Portrait of a little girl 8 years old. We had twenty-four days before she was obliged to go South for the winter.

26

A gland had been removed from her neck and there had been one or two operations on the naso-pharynx, removing adenoids and tonsils.

I used a two-screw appliance across this child's mouth and in twenty days had gained seven millimeters, and I did it with her coöperation; which means, that when she said "stop," I stopped turning the screw.

The threads of this screw were $\frac{1}{60}$ of an inch broad.

This operation was begun Dec., 1911. Her mother has lately sent me a photograph of the child taken seven years later than the first one, and which is shown herewith.

The nasal passages have remained clear, hearing is good, and health remains generally good.

It is a great satisfaction to know the outcome of these operations several years after their completion.

27 and 28

29

ILLUSTRATIONS 30, 31—(Frederick R. S.)

Models of the mouth of a boy ten years and ten months old, open and closed.

The rhinologist in attendance decided that it would be *impossible* to move the teeth at that age, and keep them in an upright position.

The models of this mouth at 17 years of age are here presented, both open and closed.

There is no further mouth breathing; the arches have been both enlarged and made almost entirely regular, a condition seldom brought about at this age.

These results are extremely gratifying, especially in view of the rarity of success in such cases.

30 and 31

FOCAL INFECTIONS: THEIR CAUSES, HISTO-PATHOLOGY AND RESULTS

By Wm. C. Miller, D.D.S., New York, N. Y.

Among the most important, or probably the most important, steps that dentistry has taken in recent years is the intelligent understanding now existing between it and the medical profession in regard to focal infections of the teeth. Up to the time when the X-ray first appeared for dental purposes, it is probable that much of the misery and complaints of mankind might be laid directly to the condition mentioned. Now, however, with all of the improvements over former obsolete methods, and the X-ray pointing its damning finger at unfilled root canals, the medical profession has awakened to the fact that dentistry is an important branch of that profession, and a corresponding increase in confidence has resulted.

By focal infections we mean, of course, those darkened areas thrown upon the X-ray film, showing a condition in the jaws apart from normal. Histologically an X-ray film of a tooth should show that organ firmly embedded in a cancellated bone tissue, with a fine delicate line running around and along the tooth indicating the peridental membrane. Any deviation from this should be looked upon with suspicion as it is a possible seat of infection.

By exhaustive labor and study in recent years it has been found that if a pure culture be taken of the germs in one of these focal infections, and compared with cultures taken from patients suffering with arthritis and endocarditis, they will be found to be identical in form, habits and action upon different cultivating media, etc. In fact, some go so far as to say now that arthritis is caused *only* by focal infection. However, if it be the case that this organism is found in arthritis and focal infections, does it not follow logically, that one must be related to the other? And since, in many patients, after removal or proper treatment of diseased teeth, the arthritis seems to disappear and the patient regain his health, does it not also logically follow that the infection is the predecessor of the arthritis?

In dealing with the causes—they are many—but the one of prime importance is improperly filled root canals, or the neglect of the operator to fill them at all. A properly filled root canal, according to present standards should, upon an X-ray film, appear as a continuous white line extending from a point in the vicinity of the floor of the pulp chamber, and downward to the end of the root, ending in a little round ball or dot at the end. There are more than one foramina at the end of a

root, these branching off near the large foramen somewhat like the branches of the Nile at its delta. The theory is that by going through the end of the root and encapsulating it these tiny openings are sealed.

Whether this is the actual case or not is hard to say, but it is the nearest approach yet to an ideal, and one which is giving positive, beneficial results.

Of course, all infections of this type are not caused by poor dentistry. Nature herself is at fault in numerous cases. Thus a tooth pulp may die due to decay and solution of the crown, through the agency of infection, or its inability to withstand thermal shock incident to its near exposure. Staphylococci, streptococci and most any of the pus-producing organisms now become active, disintegrating and breaking down the pulp with the formation of pus which may, if the exit to the mouth be clogged, work through the end of the root and form what is known as a blind abscess. Or again, a pulp may undergo death, and in the resulting decomposition, usually of the moist gangrenous type, the bacteria will form their poisonous products such as Indol, Skatol, Ptomaines, Toxins and Hydrogen sulphide, and these having no means of escape must go through the point of least resistance or the root end.

Bear in mind the histology of the teeth and jaws. The root end is embedded in cancellated bone, the trabeculae of which are abundantly filled with red marrow (which as anatomists teach us is the prime factor in forming the new erythrocytes) all intimately associated with minute capillaries and the blood vessels of the peridental membrane. The roots of some of them are near or empty into the antrum.

In the formation of pus there are, of course, the symptoms of inflammation in a mild or acute degree, with increase in the blood supply to the part and the final victory of the cocci over the leucocytes. These conditions would probably cause the formation of an acute or active abscess. However, Nature may be able to wall in or encapsulate the abscessed or diseased area, as she does in focal infection, and therein lies the danger.

Curiously enough, patients presenting with the most severe periapical infections are unaware that there is anything wrong with their teeth. If the abscess was acute, or the inflammatory conditions had been marked, they would have immediately realized their condition and would have gone to a dentist. The dentist, if he possessed the means of giving his patient a proper examination, would take his X-rays and would discover the fault at once. The condition being more or less benign, or there being but a slight feeling of malaise, does not alarm the patients, however, and they usually do not become concerned until the symptoms are pronounced, and the deleterious effects upon the health have reached alarming proportions.

Infections, the pathologists say, end in various ways, as for example, resolution, absorption, suppuration, etc. Focal infection *never* ends. Instead of a simple infection case, as a felon for example, where Nature can overcome the cocci, they are destroyed by the leucocytes and are then carried away with their toxins, and eliminated through the various excretory mechanisms. A normal histologic structure soon is restored again.

Focal infections differ, however, in that there is a continual process of absorption going on which tends to lower the vitality through the direct agency of poisonous gases and toxins, and a lowered erythrocyte count due to destruction of the cancellated bone tissue. There is generally a degree of leucocytosis which is a waste of energy, in that it draws upon Nature's secondary defense line in time of stress—the power of increasing its leucocytes. Indirectly derangements in the digestive and nervous mechanism cause a gradual falling off in health and vitality.

By a curious condition the bacteria seem to attack white fibrous connective issue, first in arthritis, as the articular, synovial membranes of the joints, and in endocarditis again by the attack upon the fibrous, elastic, tinea colli and delicate valves of the heart.

There is one treatment, and only one, for focal infection, as a prophylactic means for helping to clear up other systemic conditions. All teeth which after careful X-ray diagnosis have hopelessly large areas at their root-ends should be extracted and their sockets then curetted. Those which show but slight areas may be successfully treated by the use of proper medicaments and a proper root canal filling.

In doubtful cases, where it is deemed advisable for some reason not to extract a tooth, a paste of eugenol and iodoform may be inserted in a canal, plus a cotton point, and the tooth sealed with a permanent cement. In six months' time another X-ray is taken and very often shows a new bony deposit formed in the site of the old necrotic area. A permanent root canal filling may then be inserted. The most important preventive step, however, is the insertion of a root canal filling, which *fills* the canal, and leaves no room for a subsequent infection.

Much might be said of the comparative value of the different root canal fillings, the various preparations on the market which digest the pulp, or give off antiseptic gases, etc. However, the one which is universally used by the leading men in the dental world, and those who even specialize in filling root canals, is a solution of guttapercha in chloroform. This preparation does not undergo contraction after the chloroform evaporates; it is an X-ray opaque filling and is impervious to any action of the body fluids and will stay sterile. To insure a fairly per-

manent antiseptic action, some iodoform may be incorporated with the chloroform, which assures it a long aseptic life.

576 Fifth Avenue.

NEEDED—A FEDERAL LAW

By Paul S. Coleman, D.D.S., Wilburton, Oklahoma

It is generally supposed in dental and medical circles that the practise of these two professions comes under what is known as state rights, that is, each and every state has the right to say who shall practise medicine and dentistry within its bounds.

The states have for many years considered this one of their privileges and have enacted their laws accordingly, but during later years so drastic have the examining boards in several states become that it is almost impossible for a man who has consistently and honestly practised his profession in one state for several years to move to another state for practice. He is hedged in by examinations which are, as a rule, so severe that he finds it impossible to make grades sufficient for registration. It is not within the spirit and letter of the law that he should fail simply because he has become a little rusty upon one or two branches of the examination. In the matter of cavity preparation I have known several old and reputable practitioners to fail, and believe I am safe in saying that at least one third of the teeth which have been filled by dentists have some slight defects, and the cause is usually traceable to the fact that the patient rebels when a thorough job is being done, and in my personal practice I have many times had patients tell me when the pain had become a bit severe to please fill the cavity without much more drilling, and that they would rather pay for another filling later on in case the one I was inserting did not stay.

We all like to do our work as painlessly and with as little discomfort to the patient as possible, and for this one reason many of our oldest and most respected dentists have gotten into a rut and become rusty simply because they use many short cuts in the elimination of pain for the patient, and when they are called upon to stand an examination they find themselves a bit dull upon this point. Again, so expert have the laboratory men become in supplying and satisfying the busy dentist, that when it comes to making a crown, plate or other piece of work he relies upon them almost entirely, and I have known several men who had not made or constructed a piece of laboratory work in five or six years, and most naturally they would pass a very poor examination in prosthetics. It is no sign that because a man is a bit rusty or a little off

in his work, or has forgotten a great deal of theory that he has never had any practical use for that he did not in his youth and enthusiasm go up against the board and get through with flying colors. The chances are that he was then just as good as the youth of to-day, and when an old and honorable dentist residing in one state desires to move to another it is nothing short of the rankest injustice to submit him to a crucifying examination.

The average dentist never seems to get beyond the single idea that the reason a man wants to change locations is because he has made a failure where he is, and as many of the newer states have undergraduates who have been licensed, and sometimes have men with no diplomas upon state boards, usually the strongest opposition comes from these sections. The man without a diploma is afraid some graduate of a reputable college will come in and secure his practice; therefore in states where there are large numbers of these dentists practising you will find the examinations almost impossible—they are out to get the new applicant and usually get him.

Likewise, there are thousands of men who want to change locations or move to other states who are not failures, but for various reasons simply desire a change. Some may seek educational advantages for their children, others seek healthier climates, some would like to live by the sea, others in the mountains have a preference for the grain belts, while many prefer locations in mining and mineral sections. It matters not where a person desires to practise, he should be free and unmolested to locate where and when he chooses. It has been stated that owing to the generally inferior educational basis of the dentist, a very small percentage having reached the eighth grade, that the profession realizes the fact that it has not yet attained that broad-minded level reached by the physician years ago in matters of this kind. The members of the medical fraternity know this, and are kind enough not to express their real feelings or look upon us as a kind of monkey-show and as being a narrow-gauged, egotistical and one-wad-in-the-gun outfit; nevertheless, it has been only just a few years since a noted Eastern surgeon forgot himself so far as to express a part of his inmost feelings, and those of us who have kept track of the trend of our affairs realize to-day that he was speaking the unvarnished truth, and our ears burn even now when we think of just what this famous physician and surgeon truthfully said and intimated.

A federal law is what we need most to-day. A man, when once passed for practice, should have no strings tied upon him as to where he shall practise—every town, city, state, territory or island possession being open to him fully and freely upon his paying the regular license fee.

The states under such a law would not be deprived of all privileges,

as for instance an immoral man or drunkard could be restrained. No community wants such an individual. Advertisers of fakes and lures could likewise be restrained. States could also force the attendance of every dentist practising therein at a post-graduate session of one to three weeks yearly. We will, of course, need our examining boards to keep a curb upon the dental college, and in the future it would not make the least bit of difference how hard the examinations are or how rigid the character investigation of the candidate, we would want to be sure that the product we are securing would be first-class in the beginning, and then our national board of examiners could pass upon the members of the various state boards and see that we have a good product there also, and many of our ills would be completely and for all time cured in this respect. When once a person receives his certificate he should not be confined to one niche or corner, and the bringing of a federal law to bear upon this matter is simply and solely that of going after it, and regardless of what you believe you know, or how you have been informed, when a law of this character has once passed the House and Senate and has been signed by the President, such a law will be valid and we shall have taken another step toward the eradication of sectionalism and thus work for the benefit of the dental profession as a whole.

As so much has been said, I now propose that we take some action. Five or six dollars invested in the plan of bringing this matter before Congress by six or eight thousand dentists, together with the pressure which they are able to bring to bear from their home states upon their members in Congress and in the Senate, should secure the passage of such a bill.

MY BOOKS

Ah! well I love these books of mine
  That stand so trimly on their shelves,
With here and there a broken line
  (Fat "quartos" jostling modest "twelves").
A curious company I own,
  The poorest ranking with their betters,
In brief—a thing almost unknown,
  A pure Democracy—of Letters.

DENTAL LAWS

DENTAL LICENSE REQUIREMENTS

By Alphonso Irwin, D.D.S., Camden, N. J.

During the last few weeks we have received inquiries in regard to the Dental Regulations in many countries, from dentists in England, Canada, and the United States. Among those countries specifically inquired about are Argentina, Brazil, British West Indies, Canada, Panama, Ceylon, England, India, Italy, Mexico, and several of the states in our own land, particularly those situated in the South and West.

So far as material on hand is concerned for answering these queries, we are abundantly able to supply the information requested; for we possess Dental Laws, Dental License Requirements or information relating thereto, printed in ten different languages, besides the English, Bulgarian, Greek, Turkish, and Japanese. But the inquirers must realize that the limitations of space necessarily imposed by the issue of a monthly journal, do not permit us to enter into details regarding such distant and extensive areas, so widely separated, and with such diverse or complex dental laws, as some may enforce.

We have recently received copies of Dental Laws, License Regulation for Dentists, and useful collateral information from Argentina, Bolivia, Brazil, Chili, Colombia, Peru, Paraguay, Guatemala, Panama, Mexico, the Bahama Islands, Jamaica, and Japan; also from the Virgin Islands (formerly known as the Danish West Indies), and recently acquired by purchase by the United States from Denmark. These last named islands do not offer any allurements to the dentist as there are three dentists in the group already. Out of a population of 26,000 people, scarcely 2,000 are white, which circumstance does not enhance its value as a possible opening for the practice of dentistry, to an American dentist of the white race. We can pass by this group of islands with these few lines, but not so with the other countries asked about.

In a few countries, such as India, Ceylon, Mexico, and the British West Indies, the most salient features of their license systems can be outlined in a few paragraphs, but then much useful collateral information must be reserved for more lengthy articles. In the other countries named, only a general summary can be given here, as each government's regulations for the practice of dentistry would require separate consider-

ation. Moreover, the world-wide unrest and the consequent upheavals in legislation and governments necessitate a constant watch for changes affecting the license systems. The countries mentioned in Central and South America will be left for future consideration, when more space is available. Although much of our information has been received during the last thirty days, we prefer to wait until less turbulent conditions prevail in certain lands, before presenting their dental license regulations.

The scope of the work carried on can be sensed only when it is considered that we have investigated the attitude of one hundred and sixty governments throughout the world, toward the practice of dentistry, and ascertained their dental license system, if they possessed any. It should not seem strange that one hundred and thirty-two of these governments (commonwealths) have been either directly or indirectly involved in the consequences of the World-War. Therefore much difficulty is experienced in procuring recent advices. On the other hand, it must also be considered that few, if any, of those governments established in Europe make changes in their regulations for governing the conduct, practice and education of the professions. For this reason, and because it is exceedingly doubtful if any changes in their dental requirements *can* take place for a long time to come (owing to the chaotic conditions prevailing at the present time, and the trial tests necessary to be made, in order to reduce new forms of government to anything like stability), reliance should be placed upon investigations made prior to 1914.

DENTAL LEGISLATION IN THE SOUTHERN AND WESTERN STATES

The new legislation enacted in the States of the South and West since the year 1912, covers a broad area and opens up a prolific source of discussion. In the South the following States have passed new dental laws: Alabama, Arkansas, Florida (amended), North Carolina, Tennessee, Virginia (amended), West Virginia (amended). New legislation is also pending in several Southern States and no one can foretell the outcome until the legislatures of 1918-1919 adjourn and the Governors affix their signatures to, or exercise the veto upon, the new or amended acts.

Since 1912, in the West, new legislation has been established in the States of Arizona, California (amendments), Illinois (amendments), Indiana (amendments), Iowa (amendments), Michigan (amendments), Missouri, North Dakota (amendments), Ohio (amendments), Oklahoma, Oregon (amendments), Washington (amendments), Wisconsin (amendments), Wyoming (amended).

Amendments have been plentiful in the West and some of them are so extensive as to be entitled to be called new dental laws. Legislative activity during the sessions of 1918-1919 is also noticeable in that part of

the United States, and dentists await with interest the product for this year, which may be fruitful in producing definite legal results.

For many years prior to 1910, few or no dental Acts were passed in these sections and this quiescence was especially noticeable in the Southern States, which seemed generally to be satisfied with their existing legal enactments. But an extraordinary change in the situation, beginning to gather force, volume, and strength as far back as 1908, culminated in a series of upheavals in legislative circles that have resulted in the passing of the greatest number of laws and amendments, embodying comprehensive, progressive, and far-reaching rules and regulations for governing dentists, the practice of dentistry and dental schools, that have ever been recorded in the annals of the American nation.

On the West, attention is called particularly to the fact that "the Department of Registration and Education of the State of Illinois has succeeded to the rights, powers and duties vested by law in the late State Board of Dental Examiners. The purely professional features of the Dental Law are in the hands of a Committee, appointed from time to time by the Director of the Department for this particular purpose. All of the Administrative features of the law are handled by the Department of Registration and Education." All communications should be addressed to F. C. Dodds, Superintendent of Registration, Springfield, Illinois.

We must reiterate that in *all* of the States where *new* dental legislation has been effected, the standards of both pre-dental and professional education have been raised. If any *new* requirements are *waived* it is a clear violation of existing statutes and the *violators must be held to account* for the *infliction* of the *penalties* provided therein, for such infractions of the law usually classed as misdemeanors, and *punishable*, by stated *fines* and *imprisonment*, or *both;* while more stringent provisions for penalties and punishments for infractions of the law are made, and the legal prosecuting officers designated, so that violators of dental statutes cannot hereafter hope to escape, where such officials perform their duties faithfully. This is true in regard to the penalty inflicted for the employment of non-registered assistants, especially in the Illinois Section and Michigan laws, Sec. 7, fines $50.00 to $500.00, imprisonment thirty to ninety days, *for each* and *every offense.*

The Illinois, Michigan and Missouri dental laws illustrate particularly the intelligent comprehension phase in recent legislation and may be regarded as typical of the *onward* movement for a more highly developed degree of professional efficiency in the *great West.*

Attention is also called to the fact that several State Boards of Dental Examiners are holding special examinations for the benefit of dentists

returning from Army and Navy service. *No* legislation has been passed or is pending exempting such dentists from securing a license to practise dentistry in any State, without complying with the regular requirements of the State Dental Law. This information is official and is dated February 15, 1919. The National Board of Dental Examiners, at a meeting with the Council of National Defense in Washington, D. C., carefully considered this matter, but concluded it would not be practicable. They left it to each State Board to work out for themselves as best they could. Hence special examinations are being announced, and information in detail as to where and when the sessions are to be held, should be ascertained by writing to the Secretary of the State Board for that State where the applicant desires to locate.

We will next take up the License Requirements for dentists in several foreign countries.

BRITISH WEST INDIES

The British West Indies comprise the Bahama Islands, the Leeward Group and the Windward Group of islands, otherwise known as the Lesser Antilles, in contradistinction to the Greater Antilles, including Cuba, Hayti, Porto Rico, and Jamaica.

In the last named group Jamaica belongs to the British, and their dental law, condensed, is as follows:

Kingston, Jamaica: The Dental Practitioners' Law (Law 11 of 1905) makes provision for the registration of persons practising dentistry in Jamaica.

Section 1. Enacts that the office of the Registrar General of Births and Deaths shall be the registry of qualified dental practitioners and that the Registrar General of Births and Deaths shall be the Registrar.

Section 2. Provides for the opening of the register of qualified dental practitioners on the first of October, 1905.

Sec. 6. Enacts that the following persons, upon satisfying the Registrar by such documentary or other evidence of their right to be registered and upon payment of a registration fee of one guinea, shall be entitled to be registered under this law.

(a) Any person qualified or entitled to practise dentistry in the United Kingdom under any act for the time being in force.

(b) Any person who at the passing of this law, is bona fide engaged in the practice of dentistry in this island and who holds a diploma, license or certificate granted to him by any university, college, or institution recognized by the Governor in Privy Council, after and in consequence of his

having passed through the course of study and examination in dentistry, prescribed in such university, college or institution.

(c) Any person who at the passing of this law, is and has been for not less than three years bona fide engaged in the practice of dentistry in this island and whom the Governor in Privy Council for special cause shown permits to be registered without examination.

Sections 8, 9 and 10 provide as follows:

8. Any person who at the passing of this law is bona fide engaged in the practice of dentistry in this island; and also any person not qualified to be registered under Section 6 of this law, but who holds a diploma, license or certificate granted to him by any university, college or institution recognized by the Governor in Privy Council, after and in consequence of his having passed through the course of study and examination in dentistry prescribed by such university, college or institution, and who wishes to be registered under this law, may make application in writing to the Governor to appoint a Board of Examiners.

9. On receipt of such application the Governor shall appoint three persons, duly registered under this law, as a Board of Examiners and the persons so appointed shall thereupon fix a time and place for holding the examinations.

10. The candidate shall first satisfy the Board of Examiners that he was at the date of the passing of this law, bona fide engaged in the practice of dentistry in this island or that he holds a diploma, license or certificate granted to him as aforesaid, and the Board of Examiners, if so satisfied, shall with reasonable despatch, fully and fairly examine such candidate accordingly; and if they find him sufficiently informed and skilled, they shall give him a certificate to that effect, and he shall then be registered under this law, upon payment of the registration fee.

The above regulations continue in force at this date and were verified by official indorsement Jan. 20, 1919.

ROBERT JOHNSTONE, *Acting Colonial Secy.*,
Kingston, Jamaica.

(OTHER LOCATIONS IN MAY ISSUE)

THE TOOTH BRUSH QUEEN

"Oh, lady, please could you get me a tooth brush?"

A lanky son of Oklahoma, gaunt and hollow-eyed, looked up appealingly into the face of the Red Cross worker who had stopped beside his bed. She carried a basket filled with chocolate and a writing tablet and fountain pen. Two thousand patients had been brought into the hospital centre the night before, and she had just started out on her mission of supplying the new cases in the debarkation hospital with chocolate and writing materials, and of writing down messages to send home for those unable to do so themselves.

"Of course, I'll get you a tooth brush," she smiled down at the soldier. "But isn't there something else I can do for you? I've brought you some chocolate and perhaps you would like to send a message home."

The doughboy from the West bit off a hunk from his cake of chocolate, smacking his lips appreciatively.

"Well, now that's right kind of you," he replied, "but you know I shall be able to write home myself in a day or two. And this chocolate sure is good, but oh gee, how I do want that toothbrush. I lost mine weeks ago up at the front, where a stray shot got me and left me with this bum leg, and another put my shoulder out. I never thought I could miss a toothbrush so much."

The Red Cross canteen worker swallowed a little lump in her throat.

"I'll be back in just a moment," she said, and the Oklahoma man watched her blue gown disappear down the ward. Ten minutes later she was back with a basket of toothbrushes and toothpaste.

"Here comes the Toothbrush Queen," cried the doughboy as she walked toward him between the rows of cots. He was the first to receive attention as she distributed her wares.

"I—er—we hearn' tell as how you were a widow woman," ventured the Oklahoma man as she stopped beside him. She admitted gravely that he was right.

"I'll just remember that," he said, eyeing her reflectively. "Say, thanks a lot for that toothbrush; I'll keep it always."

The families of 250,000 soldiers and sailors are now under the care of the American Red Cross; 15,000 communities are organized for Home Service; 50,000 men and women are serving as Home Service workers.

There are about 3,700 chapters and many branches.

Only about fifty chapters in the United States are without a Home Service section.

THE JOHN R. CALLAHAN MEMORIAL

At the December, 1918, meeting of The Ohio State Dental Society, a resolution was adopted to perpetuate the memory of the late John R. Callahan in recognition of his contributions to the science and art of dentistry and his unselfish devotion to its advancement throughout the many years of his professional life.

The Committee to which this Memorial was referred has decided on the following as the most appropriate and worthy of the approval of the profession.

1st—A Bronze Memorial to be placed in The Cincinnati General Hospital Grounds.

2nd—A Callahan Memorial Research Fund. The income from which to be awarded from time to time to the person making the best contribution to the Science and Art of Root Canal Problems. The Fund and Award to be under the direction of a Committee perpetuated by The Ohio State Dental Society. The prize to be known as The John R. Callahan Award.

The sum necessary in the minds of the Committee to carry out the Memorial in its two phases should approximate $8,000, an amount that should speedily be raised in these times when the spirit of giving is universal.

Subscriptions to this fund by individuals or societies will be duly credited and should be forwarded to the Secretary-Treasurer of the Fund.

COMMITTEE

T. Irving Way, Chairman
52 Groton Building, Cincinnati
Henry E. Germann, Sec'y-Treas.
719 Gwynne Building, Cincinnati
L. L. Barber, Toledo
Weston A. Price, Cleveland
L. E. Custer, Dayton
Edward C. Mills, Columbus

DEATH OF THOMAS J. GIBLIN

We learn of the death of Dr. Thomas J. Giblin of Dorchester, Mass., with regret. Dr. Giblin was 57 years old, and was a well-known dentist of Greater Boston, where he practised his profession for over thirty years. He is survived by his widow and five children.

THE DENTAL CURE-ALL AMONG SOUTHERN "MOUNTAIN WHITES"

Perhaps the expression "Like pulling teeth" originated in the southern highlands. That's the only form of dentistry they know.

The dentist who travels the mountains of Tennessee and northern Georgia and Alabama has no sanitary operating room, and absolutely no use for the electric drill or gas. No filling teeth for him. He yanks 'em out.

Three million mountaineers live in the primitive fashion of their pioneer forebears—the English, Scottish, Irish, and French colonists. For them time has stood still for more than a century.

Their isolation, illiteracy, and too close intermarriages have resulted in arrested development. They need more schools and churches, more native preachers, modern dentists and doctors. As a part of its great plan for rebuilding the world, the Centenary Committee of the Methodist Episcopal Church has appropriated $497,200 for this work.

Many of our boys who licked the Kaiser will climb back into their mountain homes, as their fathers did after the Civil War was over. The highlanders of Kentucky gave Abraham Lincoln to the world. Perhaps there are other Lincolns hidden away in the mountain fastnesses waiting for a chance.

REPORT OF THE SURGEON-GENERAL OF THE U. S. ARMY ON THE PRESENT STATUS OF THE DENTAL CORPS

I. ENROLMENT OF DENTAL OFFICERS

The records show that when the Government entered the present war the American army had 86 dental officers, 18 of whom were captains and the remainder first lieutenants, and although our dental law permitted dental officers to advance to the grade of major, this was only possible after said officer had a record of twenty-four years of service, and limited the number to 8, regardless of how many there might be who had served the required twenty-four years. Of the 86 then on duty, only 55 were stationed in the United States, and these were widely scattered.

Although a law existed at this time which permitted the organization of a Dental Reserve Corps, no rules or regulations had been promulgated to organize such a corps until after we entered the present war, and although many dentists were eager to enter the Dental Reserve Corps, the early plan pursued made it necessary for an applicant to forward his request to the Surgeon General's office. The formal application was then furnished, to be filled out and returned to Washington. The applicant was then communicated with and was advised when the next board was to meet in his own state or an adjacent one—with the result that many days or weeks would elapse from the time the applicant would first apply until his completed papers would arrive for final decision. To prevent, if possible, this delay, the chairman of the committee on enrolment and legislation of the dental committee of the General Medical Board presented to the Surgeon-General, on June 1, 1917, the plan whereby he was to be permitted to select representative men of the dental profession who, by education and experience, were well qualified to give professional examination to any applicant who desired to be commissioned in the Dental Reserve Corps. This request, although most unusual, was immediately accepted and the authority granted. Twenty-four hours

thereafter preliminary dental examiners were appointed in every state in the union.

The men appointed as preliminary dental examiners were the deans of the well-recognized dental institutions, the secretary of each of the state dental examining boards, and such dentists in addition as the service demanded.

The end result of the appointment by the Surgeon General of the preliminary dental examiners is found in the fact that although on the day of its authorization, June 1, 1917, or relatively two months after the beginning of war, there were only five officers in the Dental Reserve Corps, yet we find that on September 18, 1917, or three and one half months thereafter, all examinations for general practitioners were discontinued, as the War Department had a sufficient number of commissioned dental officers and completed applications on file for action to care for the present and immediate future needs of the army.

Since the declaration of war the number of dental officers in the army has increased from 86 in the Dental Corps, regular army, to 212; National Guard, from nothing to 253; Dental Reserve Corps, from nothing to 5,372; making a total of 5,837—or a sufficient number to supply the quota now being assigned for an army of 5,000,000—which gives to this nation a greater number of dental officers subject to military call than all the nations combined represented by the term "the Allies."

The following two facts are considered worthy of being recorded: (1) The commission of first lieutenancy was tendered nearly 6,000 dentists, and all but 139 of these have accepted. (2) Although the Dental Reserve Corps of the army is authorized for its present strength to have 2,118 captains and 1,265 majors, there have only been 250 promoted to the grade of captain and 65 to the grade of major. This can be accounted for by the splendid plan that has been followed in regard to the question of promotion, for here we find that every dentist coming into the service must accept the grade of first lieutenant, and he cannot be advanced until after being placed on active duty, and then only does he become eligible when he has been recommended by his superior officers through military channels.

2. DENTAL LEGISLATION

On October 6, 1917, a dental law was enacted by the Senate and House of Representatives, in Congress assembled, and approved by the President, which gave to the Dental Corps of the regular army the same grades and percentages within the grades then allowed or that might thereafter be allowed by law for the Medical Corps of the regular army. This bill was referred by the Surgeon General to the Adjutant General of

the army for interpretation, and the decision was reached that under the present strength of the army, the Dental Corps was authorized to have 9 colonels, 17 lieutenant-colonels, and 67 majors, the remainder of the authorized strength of the corps to be distributed in the grades of captain and first lieutenant.

3. FREE DENTAL SERVICE

On August 19, 1917, with the approval of the Surgeon General, permission was sought from the Provost Marshal General to secure franking privileges for the Preparedness League of American Dentists, and concurrence in a plan which would make it possible for all men who had been accepted for general military service to be advised to appear before the members of that organization to have any urgently needed dental operations performed, without expense to themselves or to the Government, previous to their arrival at camp. This work was considered imperative at that time, for the reason that there was only being assigned one dentist per thousand of the total strength of the army, and also the manufacturers were unable to meet the excessive demands made upon them in the early days of the war.

The Provost Marshal General heartily approved of the proposal made, and gave every assistance possible, even urging by personal letter the governor of each state to inform all local and medical advisory boards that he approved of their appointing a dentist for volunteer service on each board to aid in the physical examinations of all men called before them, and expressed it as his opinion that the patriotic service offered by the dental profession would be of great value not only for the comfort, but for the efficiency of the national army.

Following the department's approval, a Dental Reserve Corps officer was assigned to the Preparedness League headquarters in New York, who in coöperation with the officers of that organization has increased it in the past year from about 4,000 to 16,000, and as a concrete example of what the officers and members have contributed in the form of gratuitous service for men who have been accepted for general military service it is here recorded that they have furnished the material and performed 375,000 gratuitous operations for men selected for general military service. It should also be stated that through their activity three dental motor-car ambulances have been presented to the Government, and another one is to be tendered in the immediate future.

4. SURGERY OF THE HEAD

On June 15, 1917, the Surgeon General approved of the organization of the section of the Surgery of the Head, which had among other duties

the securing of a *personnel* especially qualified to care for diseases and injuries of the brain, eye, ear, nose, throat, face, and jaws, and placed in charge a member of the Medical Corps, regular army—the commissioned *personnel* of the surgical head unit to consist of one specialist each for the brain, eye, ear, nose, and throat, one plastic or oral surgeon, and one dental oral surgeon, competent to care for fractures, impactions, and pathologic diseases to which the teeth and jaws are subject.

It is believed that by including dentists in the organization of the surgical head unit, better service will be given to our wounded soldiers who sustain injuries of the face and jaw than could possibly have resulted had these cases been handled without the assistance of those specially trained dental officers, and in addition a splendid opportunity is given to members of this profession to increase their ability and knowledge of surgical principles involved in the management of these surgical lesions.

5. EDUCATIONAL ACTIVITIES

In May and June, 1917, a majority of the dental schools of this country instituted gratuitous courses of special instruction for applicants desiring to enroll in the Dental Reserve Corps. The course was approved by the Surgeon General, and was of such a nature as to fit those in attendance to be better officers for hospital and field service. The instruction embraced the relationship of the dental officers to the supply and administrative departments of the army and military law. A number of the institutions have repeated these courses at various intervals, one of which had a total enrolment of 624. It is a conservative estimate to state that between 4,000 and 5,000 dentists attended these courses of instruction without expense to themselves or to the Government, and the dental educational institutions of this country have a right to feel proud of this contribution.

On October 15, 1917, by authority of the Surgeon General and under the direction of the subsection of plastic and oral surgery of the surgical head unit, courses of instruction in plastic and oral surgery were instituted at Washington University dental school, St. Louis, Mo., the Northwestern University dental school, Chicago, Ill., and the Thomas W. Evans Museum and Dental Institute school of dentistry, University of Pennsylvania, where medical and dental officers were detailed for instruction. The medical officers were given special instruction in plastic surgery, blood transfusion, and bone transplantation, and the dental officers in bone-fragment fixation by intra-oral splints, the systemic effects of local infections, and surgical anatomy of the face, jaws, and neck. These courses were discontinued in March, 1919.

On March 15, 1918, a school for army dental officers was instituted at Camp Greenleaf, Chickamauga Park, Fort Oglethorpe, Ga., in connec-

tion with the medical officers' training-camp, for the military and professional instruction of dental officers and their authorized dental assistants.

The duration of the general course of instruction for the dental officers is two months. The first month is given over to 180 hours of general military training, and the second to 70 hours of special military training and 110 hours devoted to professional subjects that have a definite relation to general dental practice as it should be conducted in the army. Each class consists of from 80 to 100 and a small percentage of each is retained for training to qualify them for assignment as division dental surgeons or assistants to the division dental surgeon. In the immediate future a few will be retained from each class for special instruction in roentgenology, as we have need for two dental roentgenologists for each cantonment in this country, authorization having recently been received for the installation of complete radiographic equipment in the dental unit building in each camp.

In this officers' training camp we have dentists receiving military training that is of such a nature as will greatly increase their physical and professional efficiency. Furthermore, in so far as we know, this is the only country giving such extensive special training in military and professional subjects to dental officers and their authorized assistants.

OPPORTUNITY

Master of human destinies am I!
Fame, love and fortune on my footsteps wait.
Cities and fields I walk; I penetrate
Deserts and seas remote, and passing by
Hovel and mart and palace—soon or late
I knock unbidden once at every gate!
If sleeping, wake—if feasting, rise before
I turn away. It is the hour of fate,
And they who follow me reach every state
Mortals desire and conquer every foe
Save death; but those who doubt and hesitate
Condemned to failure, penury and woe,
See me in vain and uselessly implore,
I answer not, and I return no more!

DENTAL ECONOMICS

WHY I SHOULD KEEP ACCURATE RECORDS OF BUSINESS TRANSACTIONS:

Because I am a "two-handed earner." My income is largely dependent on the labors of my own hands, though I am assisted by others.

Because there are only a few years between now and the age of 55, after which I probably cannot earn more than a living. Whatever I do in accumulating a competency must be done now.

Because I have probably not more than 1,000 income hours for each of the years of my working period. If each of these hours does not produce a profit, there is no financial hope for me in old age.

Because my office expenses are not incidental, accidental or uncertain. My recognition of them may be of these, but the expenses are constant, certain and fixed. They work 2,000 hours per year.

Because my fees cannot be fair to patients and myself unless I know my office expense, my proper remuneration, my operating cost per income hour and the average time required for each operation.

Because the tradition-determined fees or the competition-determined fees are not suited to modern technic and requirements and are evidently unprofitable for many operations, such as root canal treatment, prophylaxis, consultations and plate making.

Because if my conduct is so unbusinesslike that I have to work overtime to make a living, I cannot do any professional reading or make professional advancement. By standing still professionally I defraud my best patients and lower the standing of my profession.

Because I should like to put my service on a basis which will satisfy my professional conscience. That is, I should like to learn how to sell to patients the service that is best for them at a price that is fair to me. The first step in such selling is to learn what the price should be, and be able to justify that price against low-priced competition.

Because if I could know in the beginning of the year how much net income will be available for personal expenditure, as an employee knows, my family expenses could be adjusted and financial worry avoided.

Because if I can master a system of records that will give all this information, and can find out what I am doing and what I should do, it is unfair to my patients, to my family and to myself to decline or defer to begin learning because of the trouble it requires.

PROTECTION AGAINST FALSE PRETENSES DONE IN THE NAME OF BUSINESS

By Elton J. Buckley, Philadelphia, Pa.

[Many Digest readers may be able to call to mind cases where patients coming to them for examination have exhibited dental work about which they were evidently misinformed. Ordinary replacements were described by the patients as unusual inventions of "Dr. Soandso." Inferior artificial teeth, rubber, metals, etc., were shown with the pride born of having purchased the best, and often were described as of a certain make or name. All such instances are clear cases of false representation and the individual guilty of such practice has obtained money under false pretenses and is subject to prosecution. This information may prove interesting to such of your patients as have suffered at the hands of a faker.—Editor.]

I am getting a considerable number of inquiries from merchants and manufacturers who are being made victims of unscrupulous competition, and want to know what they can do about it. They all seem to feel that they ought to have some special law forbidding the particular kind of fraud they suffer from. An instance is the following letter:

> Omaha paint dealers are complaining of dishonest contracting painters who take jobs for which certain grades and brands are specified and who then use inferior substitutes. The inferior material soon demonstrates its worthlessness and the owner of the property, thinking that the specified brands were used, makes complaint to the manufacturer.
>
> There is no law in Nebraska—so they say—which would make conviction possible. Do you know of any law now in force, anywhere, which these paint men could have introduced?
>
> The Omaha trade will mightily appreciate your suggestions.

I also have other inquiries involving precisely the same questions, as follows:

One from a ready-made clothing dealer who asks what he can do to stop a local competitor from advertising part cotton cloth as all wool.

One from a grocer who wants relief from a chain store competitor who advertises for 21 cents a coffee represented to be "regular 35-cent coffee."

One from a fur dealer who says a competitor, by inventing a series of meaningless names for furs, is deceiving the public as to values.

I have replied to these, telling practically the same to all, viz.: that no special law, forbidding fraud in the sale of paint, or clothing, or coffee, or fur, is needed to stop these fraudulent schemes. All of them, and an

innumerable number of others, are phases of the crime of obtaining money under false pretenses, and can be punished as such.

Perhaps I need not say that there is also a civil remedy against them. The victim of the paint fraud, for instance, could sue the fraudulent painter for the difference in value between what the painter was to furnish and what he did furnish. The inquiry, however, is to what criminal remedy there is and I shall confine my answer to that.

I believe I am warranted in saying that every state in the Union has a general law making false pretense a misdemeanor. Under this law all such frauds as those under discussion can be punished. The offense, in all these statutes, is almost always described about like this:

> *Knowingly or designedly by false pretense obtaining from any person money or goods with intent to cheat or defraud any person by the same.*

These false pretense statutes are an outgrowth of the common law, for it was also a criminal offense to obtain money from anybody by false pretenses under the common law, which means the unwritten law of immemorial custom. Under them a man may be arrested and sent to jail if he contracts to supply a certain grade of paint and furnishes an inferior grade; a grocer can be arrested and imprisoned or fined if he sells as "a regular 35-cent coffee" a coffee which is no more than a regular 21-cent coffee, and so on.

The following, for example, are typical false pretenses which have been punished under these general false pretense laws:

Falsely marking casks as to quality or quantity (Iowa).

Obtaining advances of money on misrepresentation of ownership of property (North Carolina).

Obtaining credit under false pretenses (many States).

Obtaining materials to be used in one building and then using them in another, with intent to defraud (Missouri).

Obtaining money by check, knowing that the check won't be paid (Illinois).

Obtaining money by false pay rolls (Ohio).

Obtaining money by any representation that the buyer was to get greater value than he subsequently got (Massachusetts).

And there are many more, the gist of all of them being the same, viz.: getting money or some other advantage by a misrepresentation which is to the victim's disadvantage. Here is a simple guide by which you can test any act as to whether it is a criminal false pretense:

1. The statement or representation must be actually false and must be made by the man you are seeking to charge with it, or somebody acting with or for him.

2. He must have known of its falsity.

3. The person defrauded must have relied upon it.

4. The author of the false pretense must have intended to defraud through it.

5. It must have been successful.

Just apply this to the paint fraud and see how completely it fits the whole five points. No doubt at all that the thing is a false pretense and the authors of it can be arrested.

In addition to the general false pretense law, many States have additional laws covering special frauds, such as, for instance, obtaining credit under false pretenses. But even though they only have the general false pretense law they are not helpless.

COLONEL ROOSEVELT'S REMEMBRANCE

Colonel Theodore Roosevelt, shortly before his death, arranged to give substantial expression of his gratitude to the people of the little village in France near which his son Quentin is buried. Through the Red Cross he provided that $6,900 of the Nobel Peace Prize money awarded to him should be used for the benefit of the simple country people who have kept Quentin's grave covered with flowers.

Colonel Roosevelt left the decision of the exact form his gift should take to the discretion of the Red Cross, and that organization is now trying to ascertain the wishes of the villagers.

THE LOVE OF BOOKS

The only true equalizers in the world are books; the only treasure-house open to all comers is a library; the only wealth which will not decay is knowledge; the only jewel which you can carry beyond the grave is wisdom. To live in this equality, to share in these treasures, to possess this wealth, and to secure this jewel, may be the happy lot of every one. All that is needed for the acquisition of these inestimable treasures is the love of books.

DON QUIXOTE UP TO DATE

"Lead me to it," said a young American captain when a doughboy told him a German count—a high officer, of course—was waiting to surrender to a colonel.

"No colonels in my company to-day; just come with me," the captain said, and the count came.

The count wore a monocle; he carried a cane; he was some count. The doughboy didn't say "your highness," or spill any of that kind of bunk. He shook hands with the count, gave him a cigarette, and hustled him back to the prison cages like he was a regular fellow.

And perhaps the count is a regular fellow by this time. The last time the doughboy saw him he was feeding upon a package of old fashioned ginger cookies—the regular American variety—given him by a Red Cross canteen worker.

EXTRACTIONS

Man does not die, he kills himself.—*Seneca.*

At the peace table there will be German waiters.

There is no Europe. What seems so is transition.

It now looks as if we had this year's winter last winter.

Women do not pursue men. An undertaker stays in his office.

It looks as though the only use of the consumer is to be consumed.

"So dark and yet so light," said the funny man as he looked at a ton of coal the driver had just delivered.

What perfectly lovely husbands those returning soldiers, who have learned to obey orders, are going to make.

When the Kaiser told Doctor Davis that German ships would land troops in New York, he said a forkful.

A newspaper is being sued in court because the printer made an obituary conclude, "May he roast in peace."

She frowned on him and called him MR.,
Because that night for fun he KR.;
So just for spite, that very night,
The naughty MR. KR. SR.

Speaking about the effects of prohibition: Just think of the footnotes that will be necessary to make most of Bobby Burns's verse intelligible to coming generations.

The man who is riding sixty miles an hour in a big machine has nothing on the man who is riding thirty miles an hour in a flivver, because the man in the flivver thinks he is going sixty!

Herr Ebert's threat to turn Germany loose on the Allies would have more weight if he did not wear paper clothes, a blotting-paper derby, isinglass spectacles, seaweed socks, pulp shoes and a near-rubber collar.

The Complaining Witness—This big brute is my husband. He beaned me with a chunk of coal the size of his fist.

The Magistrate—Fifty dollars fine for wasting fuel. Next time you'll know enough to use a piece of brick.

"What the people of the old world need is harmony" said the man who reads history.

"Well, here's the way to do it" said the man with the musical ear: "Make Paderewski President of Poland; John McCormack King of Ireland; Caruso Emperor of Italy, and Max Rosen Ali Baba of Jerusalem. At least that would help a bit."

At night I sit and ponder
On the thousandth of an inch;
I knit my brow and scratch my head
And then my fists I clinch.
All I ask is show me the man
(And his death will be a cinch)—
The man who first invented
The thousandth of an inch!

When finally I crawl in bed,
So hopeful for a rest,
I drive my sorrows all away
With earnestness and zest;
'Tis then I dream they've caught the man
And him they now will lynch—
Having confessed he did invent
The thousandth of an inch!

NEW COMBINATION COURSE FOR U. OF P. COLLEGE AND DENTAL SCHOOL

STUDENTS IN DENTISTRY MAY NOW GET TWO DEGREES IN SEVEN YEARS

In accordance with a statement issued by Dean Quinn February 10, 1919, academic and dental students at the University of Pennsylvania may combine their courses, so as to receive the degree of Bachelor of Arts and Doctor of Dental Surgery in seven years instead of eight. This joint action of the college and dental faculties was arrived at and approved by the Provost and Trustees. According to this arrangement, a student in the course in Arts and Science may in his senior year, on the recommendation of the Dean of the college, register also as a regular student in the first year class in the School of Dentistry. Students wishing to avail themselves of this privilege are required to complete fifty-eight units of purely college work, including three units in physical education. The other nine units required for graduation will be credited to them from the studies of the first year class in dentistry, including one unit in physical education. The degree of Bachelor of Arts is awarded by the college at the satisfactory completion of the first year in the Dental School. This combination is made possible by the fact that in the first year in the Dental School students take work in chemistry, in biology and in anatomy, of such a general nature that it may be counted properly towards the securing of a bachelor's degree in the college. A similar combination has existed for some years between the College and the School of Medicine; while the Law School now requires a Bachelor's degree for admission. The combination is in accord with the movement now gaining strength throughout the country, which emphasizes the necessity of a broad cultural foundation for those pursuing professional work of any kind. It also recognizes the real necessity for economy in time of preparation for those intending to practise the profession of dentistry. A student normally enters the college at the age of eighteen, and by taking this combination he will graduate from the Dental School at the age of twenty-five.

Office of the Recorder, University of Pennsylvania, Feb. 10, 1919.

DR. FARRAND APPOINTED HEAD OF RED CROSS

Dr. Livingston Farrand, President of the University of Colorado, has been appointed by President Wilson as Chairman of the Central Committee of the American Red Cross, to succeed William H. Taft.

As Chairman of the Central Committee, Dr. Farrand became the executive head of the National Red Cross organization on the retirement of the War Council, which took place March 1st.

In changing the Red Cross from a war to a peace basis far greater tasks will be involved than those undertaken during the ante-war period, tasks that will require the full time of those interested with the executive duties.

Since the entrance of the United States into the war, Dr. Farrand has been the director of the tuberculosis work of the International Health Board in France, and has been in close contact with Red Cross activities. His broad knowledge of European conditions, his high executive qualifications and the vital force of his very unusual personality will all be vital factors in increasing the usefulness and broadening the scope of Red Cross work.

Dr. Farrand's work in this and foreign countries has shown administrative ability of the highest order and in dealing with complicated political, social and professional situations overseas he has displayed in a marked manner exceptional qualities of diplomacy, tact, and coöperation.

That the program of the American Red Cross under peace conditions will be virile, statesmanlike, and broad is unquestioned.

COURIER SERVICE FOR SOLDIERS' FAMILIES

In view of the many inquiries that are being made concerning the welfare of soldiers in the American Expeditionary Forces, the War Department has recently instituted a courier service between America and France to get information desired.

This has been done because the quick demobilization of the army and the rapid change from place to place of different units have made it almost impossible for the Red Cross in France to follow up all inquiries satisfactorily.

In cases where there is doubt concerning reports that a man has been wounded, in fact in all casualty cases, the Bureau of Communication at National Headquarters of the American Red Cross, Washington, D. C., will continue to handle inquiries, but "straight welfare inquiries" should in future be made to the Adjutant General, War Department, Washington, D. C., instead of to the Red Cross.

PRACTICAL HINTS

REMOVAL OF GREEN STAINS.—Apply tincture of iodine to the stained surface, follow by a weak solution of ammonia, repeating until the stain disappears. Recurrence will not take place if the usual subsequent care is given the teeth.—*Ohio Dental Journal.*

RECEPTACLES FOR BURS, ETC.—The small tin boxes that the Eastman dental X-ray films come packed in can be fitted in a drawer in your cabinet and make a splendid place for keeping your stock of burs, having each labeled so you can tell at a glance of what your stock consists. These boxes also are quite convenient for sandpaper disks, etc.—*Dental Review.*

PREVENTING BARBED-BROACH ACCIDENTS.—The breaking of the broach at the junction of the shank and barbed section while the instrument is in the root canal, can be reduced to a minimum by first testing the spring qualities of the broach. This is done by pulling the tip end of the broach over until it is nearly at right angles to the shank, and then letting it spring back. If it does not break it is a safe instrument to use.—*Pacific Dental Gazette.*

DENTIN.—I never expose freshly cut dentin to the fluids of the mouth when I can help it, and whether I do or do not, treat it to a touch of oil of cloves. Treating the cavity with alcohol followed by oil of cloves warmed with a puff of hot air from your chip blower, and the cavity stopped with guttapercha until the patient returns, will prevent the sensitiveness sometimes complained of after an inlay. Not only that, pulps are not so likely to die.—*Dental Review.*

VULCANIZER TOILET.—The inside of the vulcanizer, the flasks, and clamps are generally very hard to keep clean and bright during an active prosthetic practice, unless a great deal of labor is spent in cleansing them. The deposit of vulcanizing soot can be reduced to a minimum, if not entirely, by adding a small piece of sodium carbonate to the water before closing the vulcanizer. No harm is done to the case by this addition.—*Pacific Dental Gazette.*

Editor of Practical Hints:

I attended the clinic of the Denver Inlay Unit and profited greatly thereby, so much so that I have constructed a new casting machine which I believe is somewhat of an improvement over the one you were showing, in that it is not so *wobbly*, and does not require an especially keen eye, steady nerve and so on to operate it. The principle, however, is the same. I may be able to get a picture or drawing of this, and if so I shall be very glad to mail you one with a detailed description of how it is made and the working of it. I have eliminated the lever underneath the handle of your machine, which I believe you use to release the air pressure, doing this with the downward stroke of the lever which opens the valve and releases the pressure just as the cup strikes the top of the inlay ring.

So much for the machine. I have copied your oven and bunsen as well as the Oxy-Acetylene flame and the results have been most gratifying, and I must admit the credit is all due to Denver Dentists. I still have a little bad luck once in a while, and there are a few things I want to ask you again as I did not get correct notes on quite all of the technic.

First, in baking out do you use the large flame, just showing the two cones first, and for 12 minutes, then the green for 5 minutes and then the blue till you get your color in the investment, or have I got this just reversed, and should start with the blue flame? Then about the flame, do you turn the valves so you get a hissing noise after the flame is lighted, or do you turn it down till it is noiseless, and do you bring the point of the little white cone in contact with the gold, or do you use the brushy part of the flame which is 3 or 4 inches from the tip end of the blow pipe? I sometimes do not get good sharp margins with 24 carat gold. Do you consider this due to lack of heat, or some other faulty technic? Do you consider it necessary to refine your gold after each casting? What happens if you overheat your gold, or is it possible? We seldom have a bubble on the inside of the inlay but after on the outside. We are not able to overcome entirely the shrinkage at the gingival, even with our close application to the technic. I guess this will complete this questionnaire, so will close.

—G. H. VORHEES.

ANSWER.—I am very pleased to hear from you, and to learn that you got so much out of our clinic. Am especially glad if you have been able to improve in any way upon what we had. I should like to see your machine and have a more accurate description of it. We did some experimenting in an effort to do away with the lever for release of air pressure, but did not find that the automatic release worked out very

satisfactorily for us. We are having an attachment made now however, which we believe will be satisfactory.

You have the burning out times correct, if your oven and burner are the same as ours.

The Oxy-Acetylene flame should be noiseless. The whole flame should be only about two inches long, the white cone an eighth of an inch long and the blow pipe should be held about one inch from the gold to be melted, if you have the same outfit that we use.

Faulty margins may be due to too little heat; incomplete burning out of the wax; or insufficient pressure; through imperfect closure of contact of cup on ring, or faulty registration of pressure by gauge, or by failure to hold at least 100 lbs. of steady pressure upon the lever for a long enough time for the gold in the casting to become thoroughly congealed under the uniform pressure.

Gold should be refined after each casting. It is impossible to overheat pure gold for casting. Pure gold boils at very close to the melting point of platinum. This will give you an idea as to how hot it would have to be if overheated. You may, however, overheat the investment of the crucible with the Oxy-Acetylene flame and contaminate the gold with fused silica or carbon.

Be very careful not to agitate or jar the investment after placing the wax pattern in the flask. The slightest jarring will cause bubbles to rise through the investment and attach themselves to the under side of invested pattern.

Do not try to overcome the shrinkage of gold. Prepare all cavities with beveled margins at gingival, and burnish pure gold to close adaptation before cementing and again while cement is soft. If you eliminate all shrinkage and distortion of the wax, however, the shrinkage of the gold is so minute as to be scarcely perceptible.

To prevent distortion or shrinkage of the wax pattern: wax cone should be so shaped that it will permit direct contact and pressure upon the gingival seat. It should be confined at the gingival with a matrix, and pressure should be maintained occlusally until the wax has come gradually to mouth temperature. The wax pattern is now trimmed up, carved, removed and invested as promptly as possible without being subjected to any change in temperature.

Dr. Leighton B. Morris, Chairman of the Denver Inlay Unit Clinic Club is the one to whom all credit is due for the perfecting of this technic.

—V. C. S.

CORRESPONDENCE

Editor DENTAL DIGEST:

The student body of the George Washington University Dental Department has organized a society termed The George Washington University Student Dental Society, the object of which is to stimulate more interest in the student body in matters pertaining to dentistry.

The following officers were chosen: B. E. Erikson, President; R. L. Morrison, Secretary-Treasurer.

The constitution provides that the senior class be divided into groups, one of which prepares a paper, with demonstrations, to be read at each monthly meeting. The first meeting was held on February 25th, at which time a paper was read on the making of gold inlays by the indirect method, followed by demonstrations of all steps from beginning to end.

Following this there was a discussion of the paper, and it was this discussion that convinced the whole student body that the society is going to be a benefit to all, and of course a success.

R. L. MORRISON, *Secretary-Treasurer,*
1335 H Street, N. W.

Editor DENTAL DIGEST:

Your letter by Chas. F. Crouch in *re* Dental Society memberships is to the point, and really answers itself. However, allow me to emphasize an important part of same. We must educate the members of the profession to get the rest of the men in the Societies. To begin with, the qualifications for membership in Dental Societies are partly to blame. I have always contended that any man with a license to practise was eligible to membership in our Societies. The statement that all men are born free and equal will hardly hold good I think. Open the door to membership and then make your membership worth while. We must stop preaching one thing and practising another. We must get away from the journals that preach root canal fillings done surgically clean, and advertise mummifying pastes for sale. The discriminating dentist is liable to read both columns and then wonder which one is telling the truth. We must have men to teach who practise what they preach. The non-member soon learns who is at the head of our societies, and many times he does not like him. Make your societies Democratic and play fair and you will soon have most of the dentists within the ranks. After that you may play labor union tactics and make all the rest come in or work under a disadvantage to themselves and their patients.

FRANK J. RYAN, 216 S. Troy St., Chicago.

Editor DENTAL DIGEST:

Almost every day someone presents with a mouth full of work which has failed in a short time, or is so uncomfortable that it must be removed. Usually it is an amalgam filling, a discolored cheap-looking alloy, shoved deep down between the teeth, no matrix having been used and no trimming done. Or it is a gold crown with the cervical edge standing away from the tooth and cutting like a knife deep into the inflamed tissues. Generally the crown is so thin it is worn through in a few months. Or it is an inlay that the patient brings in her hand—no anchorage was used—just cement. Now these patients pertinently ask how they can tell when they fall into the hands of the man who does these things. I have quizzed many a victim and I think I can "spot" this individual. He is strong on the word "guarantee." Surely no dentist who is honest will use the word when there are so many conditions over which he has no control. The most he can do is to render skilful, conscientious service. After we err in judgment and are only too glad then to replace the piece of work, using what we think may prove a better method. Next this chap usually wants to put a gold shell crown on almost every tooth that has a cavity. I have always noticed that the poorest dentist in town puts on the most gold covers, also those miserable porcelain crowns in front where the cement "crowns a multitude of sins." And, lastly, he is generally a cut-rate man. So now when I am asked who to avoid, I say; "the man who guarantees everything; the gold crown fiend, and the one who names a fee too low to render good service."

D. F. L.

Editor DENTAL DIGEST:

In reply to Dr. Charles Wolff's question in February Digest, I would like to call attention to the fact that statistics assure us that 96% of the population require the attention of the dental profession.

Let us assume that Dr. Wolff's Italian patient, 75 years old, was one of the remaining 4 per cent. The question of race must be considered, as the mode of living and use made of the teeth count for something.

Patient (a Portuguese) recently presented who was in his forties. He had thirty-one teeth in perfectly natural occlusion and one impacted wisdom tooth. I was obliged to extract. Calculus was the predominating feature from the first bicuspids back. He had never been to a dentist before. When cleaned there were no cavities present, and very little irritation of the gingiva was necessary.

I think these Italian and Portuguese persons a very lucky pair, Nature having provided for them so well in the matter of teeth.

HARRY J. LAFFERTY, D.D.S.

THE BEST OF CURRENT THOUGHT

[*The Dental Summary*, March, 1919]

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THE RELATION OF TOOTH FORM TO THE PROTECTION OF THE INVESTING TISSUES

By H. E. Friesell, B.S., D.D.S., Pittsburgh, Pa.

(Presented before the Second District Dental Society, New York, Jan. 14, 1918)

It is a fact pretty generally recognized by dentists that the health, comfort, and usefulness of the teeth depend very largely upon the healthy condition of their investing tissues—the gums, peridental membranes, and alveolar process. But the converse of this, namely, that the health of the investing tissues depends very largely upon the protection afforded to them by the form of the teeth seems much less widely appreciated. Nevertheless the interdependence of hard and soft dental tissues upon each other furnishes one of the most beautiful examples of Nature's handiwork to be found in the human body.

TOOTH FORM IN GENERAL

In order that we may have a clear understanding of what is to follow, a brief review of tooth form in general seems appropriate. Lying upon the body of the mandible and maxillary bones we have a lighter framework, or scaffolding, of bone called the alveolar process, which surrounds and supports the greater portion of the roots of the teeth, the roots being located in cavities in the process, called alveoli. The alveoli do not surround the whole of the cementum-covered portion of the teeth, but extend up only to a point about two to four millimeters from the cemento-enamel junction.

In naming the subdivisions of a tooth it seems appropriate to the essayist that they should be termed the crown, neck and root (or roots, as the case may be). He would define the crown as the enamel-covered portion of the tooth; the root, as that portion of the tooth normally inclosed in the socket or alveolus; and the neck, as that portion of the tooth lying between the crown and the root, or, that portion of the cementum-covered part of the tooth not inclosed by the socket.

In general form the crowns of the anterior teeth, the incisors, and cuspids are shaped like a wedge with rounded angles; the labial surfaces are convex occluso-gingivally as well as mesio-distally. The lingual surfaces are concave mesio-distally, and also concave occluso-gingivally to the crest of the linguo-gingival ridge, which prominence renders the gingival portion of the lingual surfaces of these teeth convex. In other words the lingual surfaces are concavo-convex. The proximal surfaces

are convex in both directions in the incisal half, and flat or slightly concave in the gingival portion.

The posterior teeth—the bicuspids and molars—are cuboidal in form with rounded edges. The buccal and lingual surfaces are in general convex mesio-distally and occluso-gingivally, although the extension of grooves from the occlusal surface may render them concave around the grooved portions of the occlusal third of the surface.

The proximal surfaces of the bicuspids and molars are convex bucco-lingually, and concavo-convex occluso-gingivally. Sometimes in the gingival third they are also concave bucco-lingually.

THE HEIGHT OF CONTOUR

The gingival extremity of the enamel, or the junction of the enamel and cementum, is called the gingival line. If we pass from any point on the periphery of the occlusal surface to the gingival line in a direction parallel to the long axis of the tooth we will establish a line which will be convex in its entirety, or convex in the occlusal portion and concave as we approach the gingival line. The points of greatest convexity on lines of this type drawn at various portions of the surface will not be on the same horizontal plane, or equi-distant from the plane of the occlusal surface, but will vary in accordance with the general form of a particular tooth. If many of these lines be made on the axial surfaces of the tooth, running from occlusal surface to gingival line, the point of greatest convexity on each line marked, and these points connected with each other by a line circumscribing the tooth horizontally, that connecting line would indicate the *height of contour*. Or, if a tooth were placed upright upon a plane surface and numerous square edges were placed against it, the edge of each instrument would be a vertical line and would touch an axial surface of the tooth at a tangent. A line drawn through the points of contact of square edges with tooth surface would be the *line of vertical tangents*, or as the essayist prefers to term it, the "height of contour." If a tooth were viewed from the occlusal its lateral outline would be established by the height of contour, and the crest of the height of contour on the proximal surfaces would be indicated by the points of proximal contact (Fig. 1).

The height of contour marks the division between the clean and the unclean surfaces of the tooth. All tooth surface, occlusal and axial, which lies to the occlusal of the height of contour is scoured by the food in mastication and is, therefore, a clean surface, upon which no extension for prevention is required. All tooth surface between the height of contour and the gum line is an unscoured, or unclean surface. Cavities of

decay beginning thereon will spread widely over such surfaces, and extension for prevention will be required.

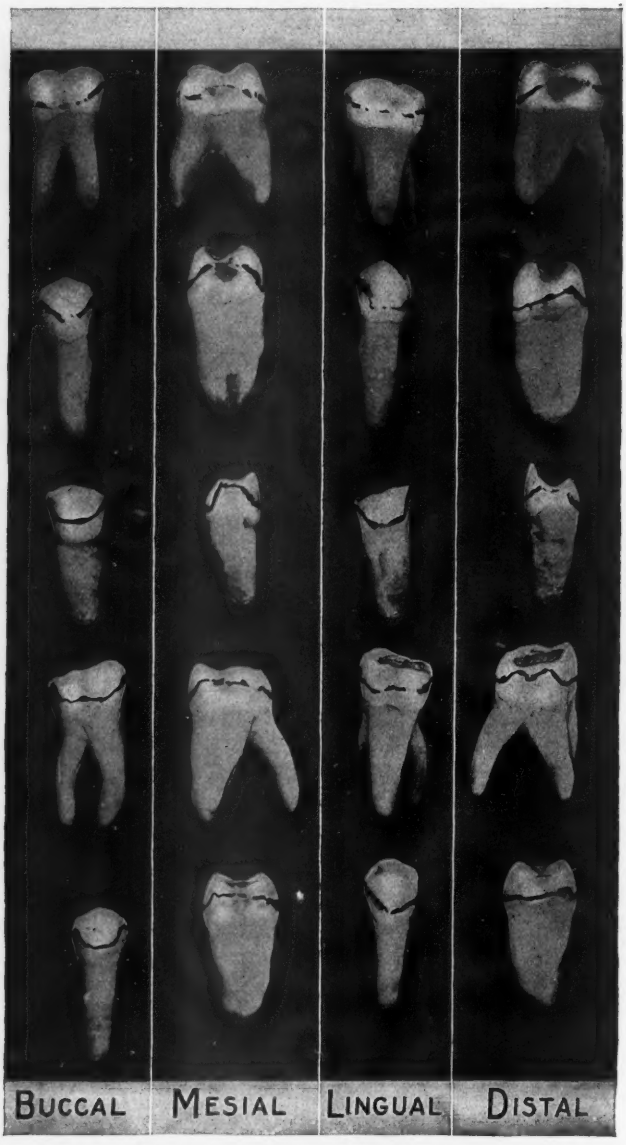

FIG. 1. Variations of height of contour indicated by black line on the several surfaces of five teeth

The general form of the height of contour as it passes around the tooth, and is viewed from the occlusal, is concave on buccal and lingual surfaces, and convex on the mesial and distal. It approaches fairly close to the occlusal extremity of the gingiva on the buccal and lingual surfaces; and on the proximal surfaces it inclines towards the occlusal, coming nearest to the latter surface at the contact points. The gum line very largely parallels the height of contour around the tooth, the two lines approaching each other very closely on the proximal surfaces, and separating more upon the buccal and lingual. Any pronounced variation from the normal in the form of a tooth surface will cause a considerable variation in the height of contour.

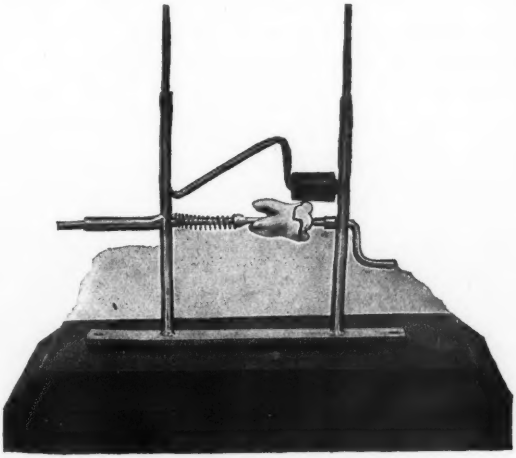

FIG. 2. Contouragraph—with tooth mounted for tracing of height of contour

To show how the height of contour may vary upon a tooth surface in accord with a departure from the ordinary form of that surface a small marking device has been made (Fig. 2). The tooth is mounted horizontally between two holders which will establish its long axis in relation to the direction of force as applied in mastication; superimposed, and parallel thereto, is mounted another roller covered with a marking material. When the tooth is rotated against the marking roller, the highest points of each surface come consecutively in contact with it and indicate the height of contour by the line that is made by the colored roller. The name "Contouragraph" has been given to this instrument.

Much stress has been laid upon the importance of the contact point, and it would be difficult to overestimate its importance; but the contact

point is only a part of the height of contour, which latter has received entirely too scant attention both in dental literature and practice.

THE CONTACT POINT

The teeth of each jaw are arranged in the form of a semi-ellipse, the long axis being represented by the median line. On account of the form of the proximal surfaces, previously described, the teeth present convex surfaces at their widest mesio-distal diameters where they come in proximal contact, and as the proximal surface slopes away in all directions (to the occlusal, gingival, buccal, and lingual) from this place of contact, we have a proximal contact, as Black has described it, "such as would be made by the contact of two marbles, or at a single small point." The form of the proximal contact, then, is a point such as one would find between two convex surfaces in touch one with the other.

The surface of the tooth immediately around the contact point will be convex but seldom uniformly so in all directions. It may appear spherical in one aspect and elliptical or ovoid in others; but in any case the actual contact should be a point of contact, not a line, or a surface of contact.

It should be remembered that the essayist is referring to the ideal, the desirable, the best form of contact—the type that we find most frequently among the best preserved dentures.

POSITION OF THE CONTACT POINT

The position of the contact point is equally as important as its form. It will not do to build up a convexity at any part of a proximal surface and because it necessarily comes first in touch with the approximating tooth, conclude that we have made a satisfactory contact point. The position of the contact point depends to a very great extent upon the form of the tooth—the form of each surface, its height of contour, the mesial and distal marginal ridges and the position of the tooth in the arch. To know where to place a contact point demands an intimate knowledge of tooth form. The best way to obtain that knowledge is by a careful study of Black's "Dental Anatomy"—the most important work in dental literature—in conjunction with the study of extracted teeth, prepared skulls, and finally the teeth of each patient.

In the best form of denture, composed of bell-crowned teeth the contact points will be found to be in a line with the cutting edges of the incisors and cuspids, and slightly to the lingual of the buccal cusps of the bicuspids and molars. However, in thick-necked teeth, and those of a more rounded contour, the contacts may be placed slightly more to

the lingual. In some dentures where the second and third molars are small and more rounded than usual the contacts may be located midway bucco-lingually.

In the best formed arches the contact points are near the occlusal surfaces, and only so far away from them as will result from the normal sloping of the marginal ridges. If the contact points be placed too close to the occlusal surface there will be a decrease in the amount of food that sweeps through the embrasures and a consequent lessening of the scouring or polishing of the exposed proximal enamel, with the result that caries will have a greater opportunity to attack those surfaces. If the contact be made too far toward the gingival, as will be the case if the marginal ridge is not reproduced, the tendency will be for food to wedge the teeth apart allowing it to impact upon the septal gingiva, something which must never be permitted. The septal gingiva fills the septal space in the form of an arch, with its convexity toward the occlusal, and the contact point should be placed where it will be just over the crest of the arch of the septal gingiva.

MARGINAL RIDGES

The mesial and distal marginal ridges are strong ridges of enamel, which form the mesial and distal boundaries of the occlusal surfaces of bicuspids and molars, and the angle of junction of the occlusal surface with the mesial and distal surfaces. These ridges are crossed by a faint groove, or fine line, indicating the line of junction with the lingual lobe of the tooth. They are rounded slightly toward the proximal surfaces, merging into the proximal convexity that extends to the height of contour.

THE INTERPROXIMAL SPACE

The teeth are considerably broader mesio-distally between their contact points than they are at the gingival line. This results in definite spaces between them called interproximal spaces. The interproximal space extends from the crest of the alveolar process to the occlusal angles of the teeth, and is bounded bucco-lingually by the buccal and lingual planes of the teeth. It is subdivided into the buccal and lingual embrasures and the septal space. The septal space is normally filled by the septal gingiva. The width and form of the interproximal space are very important, because if the space is lessened by a dropping of the teeth together as a result of proximal decay, or by an improper contouring of the proximal restoration, the health of the gingiva will be imperiled, thus inviting further proximal decay and peridental injury.

The restoration of the proper form of the interproximal space is just

as important as the restoration of the proper form of any tooth surface. A surface contact, or a line contact bucco-lingually, will necessarily render the buccal and lingual embrasures more narrow and limit the amount of food passing through them, with the results previously mentioned. Between the anterior teeth, on account of their arrangement in an arch, the labial embrasures are larger than the lingual, while between the posterior teeth the lingual embrasures are wider than the buccal, due to the lesser size of the lingual lobes of the teeth.

RELATION OF THE SOFT TISSUES TO THE TEETH

The Peridental Membrane covers the root and neck of the tooth from the apex to the gingival line. It serves as a cushion to the tooth, suspends it in the socket against displacement, possesses the tactile sense of the tooth, and in its gingival portion affords attachment of supporting fibres which extend from the neck of one tooth to that of its approximating neighbor. It also gives rise to fibres that extend into and support the free gingiva.

The Gum Tissue covers the alveolar process, the neck of the tooth, and envelops the gingival margin of the crown of the tooth for about two to three m.m. on the buccal and lingual surfaces, and almost to the height of contour on the proximal.

That portion of the gum tissue which lies to the occlusal of the crest of the alveolar process is called the gingiva. It is subdivided into the body of the gingiva, the free gingiva and the septal gingiva. The body consists of that portion of the gingiva which lies between the crest of the alveolar process and the gingival line.

The free gingiva and the septal gingiva are attached to the body of the gingiva and form the free flap of gum tissue which covers certain portions of the enamel. The free gingiva occupying the interproximal spaces is called the septal gingiva.

The filling of the septal space with gingiva and the health of that septal gingiva depend primarily upon the proper size and form of the interproximal space. It will be noted that the interproximal spaces between the anterior teeth are necessarily much narrower than are those between the posterior teeth; but Nature has provided for this condition by extending the proximal curvature of the gingival line much further toward the occlusal on the anterior teeth.

The free gingiva hugs the teeth tightly but is not attached thereto. As it approaches its occlusal extremity it becomes thinned to a very fine edge, which serves, so long as the tissue remains healthy, to prevent the ingress of food débris, etc., into the sub-gingival space.

The septal gingiva is in the form of an arch, or wedge, with its crest or apex toward the occlusal and just beneath the contact point. It slopes off in two inclines toward the gingival, the shorter and steeper slope being toward the buccal, and the longer and more gentle slope being through the lingual embrasure (Fig. 3). Between the anterior teeth the slopes are nearly equal.

FUNCTIONS OF THE CONTACT POINT

The tooth is held in place by the peridental membrane; when this membrane becomes diseased the tooth suffers proportionately in loss of function; when the peridental membrane is lost the tooth goes with it. When the peridental membrane becomes exposed to the secretions and

FIG. 3. Model of alveolar process, tooth and gingivae. Left—proximal view of normal gingiva. Centre—gingiva flattened as result of impaction of food. Right—gingiva flattened; inflamed; hypertrophied

the flora of the mouth it readily becomes diseased. It does not endure exposure to mouth conditions.

The gingiva therefore serves as a covering and protection not only to the crest of the alveolar process, but to the peridental membrane as well. A healthy peridental membrane is absolutely essential to the retention of the tooth, and as the protection of the peridental membrane depends so largely upon a healthy gingiva, the care of the latter tissue and the maintenance of its health become paramount in dental practice.

Injury to the gingiva by the impaction of food, the encroachment of calculary deposits, the irritation of dental appliances, or by the careless or ignorant use of instruments must be carefully guarded against.

The impaction of food, following the ravages of caries or unskilful dentistry, is the most prolific cause of injury to the gingiva and peridental

membrane. Tooth form as it exists originally, or as it is properly restored will fully protect these tissues against such injury.

The height of contour on the axial surfaces of the teeth causes the food to be shunted off and strike the gingiva at a tangent instead of directly, as happens when the height of contour is lost.

The contact points hold the teeth in their proper relationship to each other occlusally; maintain the proper mesio-distal width of the interproximal space; and protect the crest of the arch of the septal gingiva. They prevent the food from passing directly through and crushing the crest of the arch, and divert it buccally and lingually into the embrasures, where it strikes the inclines or slopes of the septal gingiva at a tangent, and passes harmlessly into the buccal or lingual cavity, to be returned to the occlusal surface by the tongue or cheeks until mastication is complete.

The mesial and distal marginal ridges serve as rims to keep as much of the food as possible on the occlusal surface where it can be crushed by the occluding teeth. Their proximal slopes help to give proper approach and contour to the contact point and height of contour, and the form of the marginal ridges, contact points, and height of contour combined serves to direct the food that passes into the proximal spaces in such a way that it will do no injury to the investing tissues.

If the contact be too broad bucco-lingually it will form a line contact instead of a point; will diminish the embrasures and prevent the scouring of much of the proximal enamel. If the contact be too broad gingivally, as well as laterally, it will become a surface contact, food fibre will be caught and held between the teeth, wedging them apart, and as other fibres accumulate, the whole mass will crush against the septal crest, flattening it and leaving a space between the teeth to become filled with food débris and give rise to injury of the tooth or gingiva through fermentative or putrefactive changes.

Sometimes in cases of proximal impaction of the food from faulty contacts we find the septal tissue not only flattened bucco-lingually, which permits food to strike it directly instead of at a tangent, but even depressed in the centre, forming a pocket. Inflammation results and the gingiva in the buccal and lingual embrasures becomes swollen and hypertrophied; suppuration occasionally results and a gingival abscess develops, which not infrequently discharges on the buccal or lingual surface of the gum, and simulates the opening of a sinus from an alveolar abscess (Fig. 4).

If the proper form of a tooth be maintained in its marginal ridges, height of contour, and contact points, the most prolific cause of peridental disease will be eliminated. The dentist who makes himself familiar with tooth form and develops the skill to restore it, or maintain it, may be

FIG. 4. Model of alveolar process, tooth and gingivae. Upper—buccal view showing from left to right—normal gingiva; gingiva with open space; hypertrophied gingiva. Centre—lingual view of same. Lower—model of gingiva with teeth removed; buccal view.—Left, normal; centre, flattened; right, hypertrophied.

safely trusted to work no injury to the investing tissues of the teeth through the placing of crude appliances, or careless instrumentation. I doubt whether any other kind of a dentist should be permitted to operate in the human mouth.

The conception of tooth form possessed by too large a percentage of the members of our profession, if we are to judge by their restorations (which is placing a charitable construction upon the matter), is just about as near correct as the ancient Japanese idea of the human viscera.

And now, while we are having post-graduate courses in many branches of dentistry, it seems to the essayist that one of the most important fields for such work would be some real post-graduate study in Dental Anatomy.—*Items of Interest.*

The Victory Loan is a Grand Finish for a World Tragedy

FUTURE EVENTS

The Fifty-fifth Annual Meeting of the Connecticut State Dental Association will be held in the Chamber of Commerce Assembly Hall, 252 Asylum St., Hartford, Conn., on Tuesday and Wednesday April 15th and 16th. The program is replete with many interesting features and all members of the National Dental Association are cordially invited to attend.

Further information will be supplied by the Secretary.

MORTON J. LOEB,
35 Elm St., New Haven, Conn.

Announcement of the Clinic Committee of the Missouri Dental Association at Statler Hotel, St. Louis, Mo., April 14th, 15th and 16th, 1919.

The clinic program for the Fifty-fourth Annual Meeting of the Missouri Dental Association promises to be an unusually interesting and profitable one.

Wednesday afternoon, April sixteenth, has been set aside for our table clinics. Special features have been arranged by which you can see your favorite clinic without confusion.

All clinics must be handed in before March twenty-fourth. If you have not done so, mail the title of your clinic at once to

CHARLES P. GROSBY, *Chairman*, Frisco Bldg., St. Louis, Mo.

The Thirty-ninth Annual Convention of the Texas State Dental Society will be held at Waco, Texas, April 22d to 25th, 1919.

Several men of national prominence will conduct the Post-Graduate feature of the meeting, which will supplement the program of papers and clinics by members of the Society.

J. G. FIFE, *Secretary*,
736 Wilson Building, Dallas, Texas.

The Fifty-first Annual Meeting of the Pennsylvania State Dental Society will be held at the William Penn Hotel, Pittsburgh, Pennsylvania, Tuesday, Wednesday, and Thursday, April 29, 30, and May 1, 1919. An interesting and instructive program has been prepared. All ethical practitioners are invited to attend.

J. F. BIDDLE, *Secretary*,
517 Arch St., Pittsburgh, Pa.

The Ontario Dental Society will hold its Annual Meeting in Toronto, Ontario, Monday, Tuesday, Wednesday, and Thursday, April 28, 29, 30, and May 1, 1919.

J. A. BOTHWELL, *Secretary*,
604 Spadina Ave., Toronto.

The Annual Meeting of the Iowa State Dental Society will be held in Des Moines, Iowa, May 6, 7, 8, 1919. An interesting program has been arranged. Men from out of the state holding National cards are cordially invited to attend all sessions.

For further information address,

Dr. E. R. SWANK, *Sec'y*, C. N. B. Bldg., Des Moines, Iowa.

The Northern Ohio Dental Association Meeting will be held in Cleveland, Ohio, Monday, Tuesday, and Wednesday, June 2, 3, and 4, 1919, at Hotel Statler.

GEORGE B. SMITH, *Secretary*.

The next meeting of the State Board of Dental Examiners will be held at Bamberg, S. C., commencing promptly at 9 o'clock, Monday morning, June 16, 1919. All applications should be in the hands of the secretary by June 6th.

R. L. SPENCER, *Secretary*,
Bennettsville, S. C.

The Northwestern University Dental School Annual Homecoming Clinic will be held June 16 and 17, 1919. A splendid program has been arranged for each day, covering subjects of vital interest in the practice of modern dentistry.

For information please communicate with the secretary of the alumni association.

M. M. PRINTZ,
25 E. Washington St., Chicago, Ill.

The Annual Meeting of the South Carolina State Dental Association will be held in Columbia, S. C., June 19, 20, 21. The place is South Carolina University Campus.

G. A. MILNER, *Pres.;* ERNEST C. DYE, *Secy.*

The next meeting of the Indiana State Board of Dental Examiners will be held at the State house, Indianapolis, June 23 to 28, 1919, inclusive. For application and instructions, write to H. C. MCKITTRICK, *Secretary-Treasurer*, 605 Hume-Mansur Building, Indianapolis.

The next meeting of the Vermont Board of Dental Examiners, for the examination of candidates to practice in Vermont, will be held at the Statehouse, Montpelier, commencing at 2 P.M., on June 30th, 1919, and continuing for three days. To be eligible for examinations a candidate must be (1) twenty-one years of age, (2) a graduate of a high school of the first class, and (3) a graduate of a reputable dental college.

Applications must be in the hands of the Secretary not later than June 1st.

HARRY F. HAMILTON. *Sec'y*, Newport, Vermont.

Psi Omega Fraternity, New Orleans. Grand Chapter Meeting and National Alumni Chapter Meeting, October 20–24, 1919.

At the Annual Meeting of the American Institute of Dental Teachers, held at the Piedmont Hotel, Atlanta, Georgia, the following officers were elected for the ensuing year: President, Dr. R. W. Bunting, Ann Arbor, Mich.; Vice-President Dr. Arthur D. Black, Chicago, Ill.; Secretary-Treasurer, Dr. Abram Hoffman, Buffalo, N. Y.; Executive Board, Dr. G. S. Millberry, San Francisco, Dr. A. H. Hipple, Omaha, Dr. A. E. Webster, Toronto.

The next regular meeting will be held at Detroit, Michigan.

ABRAM HOFFMAN, *Secretary*,
381 Linwood Avenue, Buffalo, N. Y.